

=> fil reg
 FILE 'REGISTRY' ENTERED AT 12:27:52 ON 01 JUN 2011
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STRUCTURE FILE UPDATES: 31 MAY 2011 HIGHEST RN 1303643-78-8
 DICTIONARY FILE UPDATES: 31 MAY 2011 HIGHEST RN 1303643-78-8

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 predicted properties as well as tags indicating availability of
 experimental property data in the original document. For information
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L2	29	SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON (10025-73-7/BI OR 10241-05-1/BI OR 22519-64-8/BI OR 7447-39-4/BI OR 7550-45-0/BI OR 7646-78-8/BI OR 7646-85-7/BI OR 7718-98-1/B I OR 7772-99-8/BI OR 851190-38-0/BI OR 851190-39-1/BI OR 851190-40-4/BI OR 851190-41-5/BI OR 851190-42-6/BI OR 851190-43-7/BI OR 851190-44-8/BI OR 851190-45-9/BI OR 851190-46-0/BI OR 851190-47-1/BI OR 851190-48-2/BI OR 851190-49-3/BI OR 851190-50-6/BI OR 851190-51-7/BI OR 851190-53-9/BI OR 851190-54-0/BI OR 851190-55-1/BI OR 851190-56-2/BI OR 851190-57-3/BI OR 851190-58-4/BI)
L6	1828	SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON (LI(L)FE(L)P(L)O) /ELS
L7	1338	SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON L6 AND O4P
L8	121	SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON L7 AND 4/ELC.SUB
L10	330	SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON L7 AND (V OR CR OR CU OR ZN OR IN OR SN OR MO OR TI)/ELS
L11	20	SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON L10 AND L2
L12	9	SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON L2 NOT L11
L13	189	SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L10
L14	99730	SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L12
L15	8	SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L13 AND L14
L16	761	SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L7
L17	12	SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L14 AND L16
L18	12	SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L15 OR L17
L20	595	SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L16 AND ELECTROCHE M?/SC,SX
L21	149	SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L20 AND (HALIDE? OR CHLORIDE? OR FLUORIDE? OR BROMIDE? OR IODIDE?)
L22	95725	SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON "SECONDARY

BATTERIES"+PFT/CT

L23 121 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L21 AND L22

L24 49 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L23 AND PROC/RL

L25 15 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L13 AND L24

L27 QUE SPE=ON ABB=ON PLU=ON CATHODE# OR POSITIVE ELECTRODE#

L28 42 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L24 AND L27

L29 33 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L28 AND PREP/RL

L30 39 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L25 OR L29

L31 34 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L30 NOT L18

L37 1 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON "IRON LITHIUM PHOSPHATE"/CN

L38 497 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L37

L39 368 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L38 AND L27

L40 297 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L39 AND L22

L41 100 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L40 AND PROC/RL

L42 3 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L41 AND L13

L43 12 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L38 AND L13

L44 38 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L38 AND L16

L45 38 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L43 OR L42 OR L44

L46 34 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L45 AND ELECTROCHEM?/SC, SX

L52 125 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L8

L53 111 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L52 AND ELECTROCHEM?/SC, SX

L54 80 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L53 AND L22

L55 65 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L54 AND L27

L57 37 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L55 AND (1840-2006)/PRY,AY,PY

L58 3 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L18 AND (1840-2006)/PRY,AY,PY

L59 13 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L46 AND (1840-2006)/PRY,AY,PY

L60 16 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L31 AND (1840-2006)/PRY,AY,PY

L61 29 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L59 OR L60

L62 29 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L61 NOT L58

L63 37 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L57 NOT L58

L64 57 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L62 OR L63

L65 60 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L58 OR L64

L66 32 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L65 AND PROC/RL

L67 44 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L65 AND PREP/RL

L68 49 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L66 OR L67

L69 26 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L68 AND DEV/RL

L71 11 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L68 AND CATHODE MATERIAL?

L72 31511 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON "BATTERY CATHODES"+PFT/CT

L73 37 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L68 AND L72

L74 41 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L69 OR L71 OR L73

L75 20 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L74 AND (HALIDE? OR CHLORIDE? OR FLUORIDE? OR BROMIDE? OR IODIDE?)

L76 41 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L74 OR L75

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FILE 'HCAPLUS' ENTERED AT 12:27:58 ON 01 JUN 2011

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FILE COVERS 1907 - 1 Jun 2011 VOL 154 ISS 23
 FILE LAST UPDATED: 30 May 2011 (20110530/ED)
 REVISED CLASS FIELDS (/NCL) LAST RELOADED: Apr 2011
 USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Apr 2011

HCAplus now includes complete International Patent Classification (IPC) reclassification data for the fourth quarter of 2010.

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This file contains CAS Registry Numbers for easy and accurate substance identification.

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L76 ANSWER 1 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
 ACCESSION NUMBER: 2009:1526409 HCAPLUS Full-text
 DOCUMENT NUMBER: 152:41294
 TITLE: Electrode materials for electrochemical cells
 INVENTOR(S): Allen, Jan L.; Jow, T. Richard
 PATENT ASSIGNEE(S): United States Dept. of the Army, USA
 SOURCE: U.S., 10pp.
 CODEN: USXXAM
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
US 7629080	B1	20091208	US 2005-185845	20050721
			<--	
PRIORITY APPLN. INFO.:			US 2004-591965P	P 20040723
			<--	

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STIN: 09 Dec 2009

AB A lithiated metal phosphate material is doped by a portion of the lithium atoms which are present at the M2 sites of the material. The doped material has the general formula: $Lil+xM1-x-dDdPO_4$. In the formula, M is a divalent ion of one or more of Fe, Mn, Co and Ni. D is a divalent metal ion which is one or more of Mg, Ca, Zn, and Ti. It is present in an amount represented by the subscript d which has a value ranging from 0 to 0.1. The portion of the lithium which is present at the M2 octahedral sites of the material is represented by the subscript x and is greater than 0 and no more than 0.07.

Also disclosed are electrodes which incorporate the material as well as batteries, including lithium ion batteries, which include cathodes fabricated from the doped, lithiated metal phosphate materials.

IT 1020400-44-5P, Iron lithium phosphate (Fe_{0.98}Li_{1.02}(PO₄))
 (electrode material; electrode materials for electrochem. cells)
 RN 1020400-44-5 HCAPLUS
 CN Iron lithium phosphate (Fe_{0.98}Li_{1.02}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	1.02	7439-93-2
Fe	0.98	7439-89-6

IT 1020400-45-6, Iron lithium phosphate (Fe_{0.96}Li_{1.04}(PO₄))
 1020400-46-7, Iron lithium phosphate (Fe_{0.95}Li_{1.05}(PO₄))
 (electrode material; electrode materials for electrochem. cells)
 RN 1020400-45-6 HCAPLUS
 CN Iron lithium phosphate (Fe_{0.96}Li_{1.04}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	1.04	7439-93-2
Fe	0.96	7439-89-6

RN 1020400-46-7 HCAPLUS
 CN Iron lithium phosphate (Fe_{0.95}Li_{1.05}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	1.05	7439-93-2
Fe	0.95	7439-89-6

INCL 429221000; 429223000; 429224000; 429231600; 429229000; 429231950;
 429231100; 252182100

IPCI H01M0004-36 [I,A]

IPCR H01M0004-36 [I,A]

NCL 429/221.000; 252/182.100; 429/223.000; 429/224.000; 429/229.000;
 429/231.100; 429/231.600; 429/231.950

CC 52-2 (Electrochemical, Radiational, and Thermal Energy
 Technology)

IT Battery cathodes
 Electrically conductive pastes
 Electrochemical cells
 (electrode materials for electrochem. cells)

IT Secondary batteries

(lithium; electrode materials for electrochem. cells)

IT 1020400-44-5P, Iron lithium phosphate (Fe_{0.98}Li_{1.02}(PO₄))

(electrode material; electrode materials for electrochem. cells)

IT 1020400-45-6, Iron lithium phosphate (Fe_{0.96}Li_{1.04}(PO₄))

1020400-46-7, Iron lithium phosphate (Fe_{0.95}Li_{1.05}(PO₄))

1198601-70-5, Iron lithium magnesium phosphate

(Fe_{0.9}Li_{1.05}Mg_{0.05}(PO₄)) 1198601-72-7, Iron lithium titanium

phosphate (Fe_{0.92}Li_{1.02}Ti_{0.06}(PO₄)) 1198601-73-8, Iron lithium zinc

phosphate (Fe_{0.95}Li_{1.03}Zn_{0.02}(PO₄))

(electrode material; electrode materials for electrochem. cells)
 REFERENCE COUNT: 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE
 RE FORMAT

L76 ANSWER 2 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
 ACCESSION NUMBER: 2008:1102148 HCAPLUS Full-text
 DOCUMENT NUMBER: 149:359432
 TITLE: Nanoscale ion-storage materials
 INVENTOR(S): Chiang, Yet-Ming; Gozdz, Antoni S.; Payne, Martin
 W.
 PATENT ASSIGNEE(S): A123 Systems, Inc., USA
 SOURCE: PCT Int. Appl., 77pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 4
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2008109209	A2	20080912	WO 2008-US52584	20080131
WO 2008109209	A3	20081204		
W:	AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW			
RW:	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AP, EA, EP, OA			
US 20070190418	A1	20070816	US 2007-672931	20070208
			<--	
KR 2009109124	A	20091019	KR 2009-7018664	20080131
EP 2118949	A2	20091118	EP 2008-782740	20080131
R:	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LI, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR			
JP 2010517917	T	20100527	JP 2009-549177	20080131
CN 101669234	A	20100310	CN 2008-80009462	20090923
PRIORITY APPLN. INFO.:			US 2007-672931	A 20070208
			US 2007-888929P	P 20070208
			US 2005-706273P	P 20050808
			<--	
			US 2005-741606P	P 20051202
			<--	
			US 2006-396515	A2 20060403
			<--	
			WO 2008-US52584	W 20080131

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
 ED Entered STN: 12 Sep 2008

AB Nanoscale ion storage materials are provided that exhibit unique properties measurably distinct from their larger scale counterparts. For example, the nanoscale materials can exhibit increased electronic conductivity, improved electromech. stability, increased rate of intercalation, and/or an extended range of solid solution. Useful nanoscale materials include alkaline transition metal phosphates, such as LiMPO_4 , where M is one or more transition metals. The nanoscale ion storage materials are useful for producing devices such as high energy and high power storage batteries, battery-capacitor hybrid devices, and high rate electrochromic devices. Nanoscale ion storage materials are provided that exhibit unique properties measurably distinct from their larger scale counterparts. For example, the nanoscale materials can exhibit increased electronic conductivity, improved electromech. stability, increased rate of intercalation, and/or an extended range of solid solution. Useful nanoscale materials include alkaline transition metal phosphates, such as LiMPO_4 , where M is one or more transition metals. The nanoscale ion storage materials are useful for producing devices such as high energy and high power storage batteries, battery-capacitor hybrid devices, and high rate electrochromic devices.

IT 714249-20-4P, Iron lithium phosphate ($\text{FeLi}_{0.99}(\text{PO}_4)$)

876064-87-8P, Iron lithium phosphate ($\text{FeLi}_{0.95}(\text{PO}_4)$)

(nanoscale ion storage materials)

RN 714249-20-4 HCAPLUS

CN Iron lithium phosphate ($\text{FeLi}_{0.99}(\text{PO}_4)$) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O4P	1	14265-44-2
Li	0.99	7439-93-2
Fe	1	7439-89-6

RN 876064-87-8 HCAPLUS

CN Iron lithium phosphate ($\text{FeLi}_{0.95}(\text{PO}_4)$) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O4P	1	14265-44-2
Li	0.95	7439-93-2
Fe	1	7439-89-6

IT 411234-54-3, Iron lithium phosphate

(nanoscale ion storage materials)

RN 411234-54-3 HCAPLUS

CN Phosphoric acid, iron lithium salt (9CI) (CA INDEX NAME)



● x Fe(x)

● x Li

IPCI H01M0004-58 [I,A]; H01M0010-44 [I,A]; C01B0025-45 [I,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]; C01B0025-00 [I,C]; C01B0025-45 [I,A]
 IPCR C01B0025-45 [I,A]; H01M0004-02 [N,A]; H01M0004-58 [I,A]; H01M0010-052 [I,A]; H01M0010-36 [I,A]; H01M0010-44 [I,A]
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 74, 76
 IT Secondary batteries
 (lithium; nanoscale ion storage materials)
 IT Battery cathodes
 Electrochromic devices
 Nanostructured materials
 Open circuit potential
 Surface area
 (nanoscale ion storage materials)
 IT 714249-20-4P, Iron lithium phosphate (FeLi_{0.99}(PO₄))
 876064-87-8P, Iron lithium phosphate (FeLi_{0.95}(PO₄))
 (nanoscale ion storage materials)
 IT 7664-38-2D, Phosphoric acid, lithium transition metal compound
 15365-14-7D, Iron lithium phosphate felipo₄, lithium-deficient
 411234-54-3, Iron lithium phosphate
 (nanoscale ion storage materials)

L76 ANSWER 3 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2008:816094 HCAPLUS Full-text

DOCUMENT NUMBER: 149:204396

TITLE: Preparation of metal-doped ferrous oxalate dihydrate as iron source material for preparing metal-doped lithium iron(II) phosphate for use in lithium ion batteries

INVENTOR(S): Cao, Wenyu; Zhang, Shuiyuan; Xiao, Feng

PATENT ASSIGNEE(S): BYD Company Limited, Peop. Rep. China

SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 26pp.
 CODEN: CNXXEV

DOCUMENT TYPE: Patent

LANGUAGE: Chinese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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CN 101209820	A	20080702	CN 2006-10167328	20061227
			<--	
CN 101209820	B	20100519		
PRIORITY APPLN. INFO.:			CN 2006-10167328	20061227
			<--	

ED Entered STN: 08 Jul 2008

AB Metal-doped ferrous oxalate dihydrate is prepared by contacting a ferrous salt (ferrous sulfate, ferrous chloride and/or ferrous acetate) and a soluble nonferrous metal salt with an oxalate salt till the pH of the mixed solution is 3-6. The nonferrous metal salt can be a sulfate, nitrate and/or chloride of a IIA metal, IIIA metal, IVA metal, such as magnesium sulfate, aluminum sulfate, or zirconium sulfate. The oxalate can be sodium oxalate, potassium oxalate, ammonium oxalate, and/or lithium oxalate. The lithium iron phosphate is prepared by sintering a mixture of a lithium source, phosphorus source and the iron source material at 650-850° for 8-40 h in an inert gas or reducing gas atm; followed by cooling. The lithium source can be lithium hydroxide, lithium carbonate, or lithium acetate. The phosphorus source can be ammonium

phosphate, ammonium hydrogen phosphate, or lithium phosphate. The mol. ratio of lithium to iron to phosphorus is (1-1.07):1:1. The obtained lithium iron(II) phosphate has a small particle size, uniform particles, good conductivity and electrochem. properties.

IT 912841-83-9P, Cobalt iron lithium phosphate
912841-84-0P, Iron lithium nickel phosphate
(preparation of metal-doped ferrous oxalate dihydrate as iron source material for preparing metal-doped FeLiPO₄ for use in lithium ion batteries)

RN 912841-83-9 HCAPLUS

CN Cobalt iron lithium phosphate (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O4P	x	14265-44-2
Co	x	7440-48-4
Li	x	7439-93-2
Fe	x	7439-89-6

RN 912841-84-0 HCAPLUS

CN Iron lithium nickel phosphate (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O4P	x	14265-44-2
Ni	x	7440-02-0
Li	x	7439-93-2
Fe	x	7439-89-6

IT 7772-99-8, Stannous chloride, reactions
(preparation of metal-doped ferrous oxalate dihydrate as iron source material for preparing metal-doped FeLiPO₄ for use in lithium ion batteries)

RN 7772-99-8 HCAPLUS

CN Tin chloride (SnCl₂) (CA INDEX NAME)

C1-Sn-C1

IPCI C01B0025-45 [I,A]; H01M0004-58 [N,A]; H01M0004-58 [I,A]

IPCR C01B0025-00 [I,C]; C01B0025-45 [I,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49

IT Battery cathodes

Electric capacitance

Electric conductivity

Particle size

Particle size distribution

(preparation of metal-doped ferrous oxalate dihydrate as iron source material for preparing metal-doped FeLiPO₄ for use in lithium ion batteries)

IT 554453-36-0P, Aluminum iron lithium phosphate 554453-37-1P, Iron lithium zirconium phosphate 554453-38-2P, Iron lithium manganese phosphate 554453-42-8P, Iron lithium magnesium phosphate

912841-83-9P, Cobalt iron lithium phosphate
 912841-84-0P, Iron lithium nickel phosphate
 (preparation of metal-doped ferrous oxalate dihydrate as iron source
 material for preparing metal-doped FeLiPO₄ for use in lithium ion
 batteries)

IT 7782-42-5, Graphite, uses 24937-79-9, Polyvinylidene
 fluoride
 (preparation of metal-doped ferrous oxalate dihydrate as iron source
 material for preparing metal-doped FeLiPO₄ for use in lithium ion
 batteries)

IT 62-76-0, Sodium oxalate 546-89-4, Lithium acetate 553-91-3,
 Lithium oxalate 554-13-2, Lithium carbonate 583-52-8, Potassium
 oxalate 1113-38-8, Ammonium oxalate 1310-65-2, Lithium hydroxide
 3094-87-9, Ferrous acetate 7446-70-0, Aluminum chloride,
 reactions 7646-79-9, Cobaltous chloride, reactions
 7718-54-9, Nickelous chloride, reactions 7720-78-7,
 Ferrous sulfate 7722-76-1, Ammonium dihydrogen phosphate
 7733-02-0, Zinc sulfate 7758-94-3, Ferrous chloride
 7772-99-8, Stannous chloride, reactions 7773-01-5,
 Manganous chloride 7782-63-0, Ferrous sulfate heptahydrate
 7783-28-0, Ammonium hydrogen phosphate 7784-31-8, Aluminum sulfate
 octadecahydrate 7785-87-7, Manganous sulfate 7786-30-3, Magnesium
 chloride, reactions 7790-69-4, Lithium nitrate 10034-99-8,
 Magnesium sulfate heptahydrate 10043-52-4, Calcium chloride
 , reactions 10099-59-9, Lanthanum nitrate 10101-97-0, Nickel
 sulfate hexahydrate 10124-43-3, Cobaltous sulfate 10361-37-2,
 Barium chloride, reactions 10361-65-6, TriAmmonium
 phosphate 10377-52-3, Lithium phosphate 10377-60-3, Magnesium
 nitrate 10476-85-4, Strontium chloride 13453-80-0,
 Lithium dihydrogen phosphate 13473-90-0, Aluminum nitrate
 13746-89-9, Zirconium nitrate 33943-39-4, Dilithium hydrogen
 phosphate
 (preparation of metal-doped ferrous oxalate dihydrate as iron source
 material for preparing metal-doped FeLiPO₄ for use in lithium ion
 batteries)

L76 ANSWER 4 OF 41 HCAPLUS COPYRIGHT 2011 ACS ON STN
 ACCESSION NUMBER: 2008:778038 HCAPLUS Full-text
 DOCUMENT NUMBER: 149:108256
 TITLE: Mixed lithium/sodium iron fluorophosphate
 cathode materials for
 lithium-ion batteries
 INVENTOR(S): Nazar, Linda Faye; Makahnouk, Michael; Ellis,
 Brian; Toghill, Kathryn; Makimura, Yoshinari
 Can.
 PATENT ASSIGNEE(S): U.S. Pat. Appl. Publ., 31pp.
 SOURCE: CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20080153002	A1	20080626	US 2007-946038	20071127
			<--	
PRIORITY APPLN. INFO.:			US 2006-861058P	P 20061127
			<--	

ED Entered STN: 27 Jun 2008

AB Li_xNa_{2-x}FePO₄F with 0<x≤2 was prepared by exchanging Li ions for Na ions in Na₂FePO₄F. The compound may be used as a cathode material for a Li ion battery. The battery may be comprised of an electrode active material Li₂FePO₄F, an anode and an electrolyte. Na₂FePO₄F may be synthesized by a flux reaction. Microcryst. Na₂FePO₄F may be synthesized by a solution method. Na₂FePO₄F may be used as a cathode material for a Li ion battery and may be C composite coated.

IT 1034495-99-2F, Iron lithium sodium fluoride phosphate (Fe(Li,Na)2F(PO₄)) (mixed lithium/sodium iron fluorophosphate cathode materials for lithium-ion batteries)

RN 1034495-99-2 HCAPLUS

CN Iron lithium sodium fluoride phosphate (Fe(Li,Na)2F(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O4P	1	14265-44-2
Na	0 - 2	7440-23-5
Li	0 - 2	7439-93-2
Fe	1	7439-89-6

INCL 429221000; 423301000; 252182100

IPCI H01M0004-52 [I,A]; C01B0025-10 [I,A]

IPCR C01B0025-10 [I,A]; H01M0004-02 [N,A]; H01M0004-58 [I,A]; H01M0010-0525 [I,A]; H01M0010-36 [I,A]

NCL 429/221.000; 252/182.100; 423/301.000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 72, 78

ST lithium sodium iron fluorophosphate cathode lithium battery

IT Secondary batteries
(lithium; mixed lithium/sodium iron fluorophosphate cathode materials for lithium-ion batteries)

IT Battery cathodes
(mixed lithium/sodium iron fluorophosphate cathode materials for lithium-ion batteries)

IT Crystal structure
(of sodium iron fluorophosphate cathode materials for lithium-ion batteries)

IT 7440-44-0, Carbon, uses
(carbon-coated lithium/sodium iron fluorophosphate cathode materials for lithium-ion batteries)

IT 7550-35-8, Lithium bromide (LiBr) 10377-51-2, Lithium iodide (LiI)
(in preparation of mixed lithium/sodium iron fluorophosphate cathode materials for lithium-ion batteries)

IT 107-21-1, Ethylene glycol, uses 110-71-4, DME 554-95-0, 1,3,5-Benzenetricarboxylic acid
(in preparation of sodium iron fluorophosphate cathode materials for lithium-ion batteries)

IT 7727-21-1 13826-86-3 14635-75-7
(in preparation of sodium iron fluorophosphate cathode materials for lithium-ion batteries)

IT 127-09-3, Sodium acetate 144-55-8, Sodium carbonate (NaHCO₃), reactions 497-19-8, Sodium carbonate (Na₂CO₃), reactions 1345-25-1, Ferrous oxide, reactions 3094-87-9, Iron(II) acetate 6047-25-2, Iron oxalate (FeC₂O₄) dihydrate 7664-38-2, Phosphoric

acid, reactions 7681-49-4, Sodium fluoride (NaF),
 reactions 7722-76-1, Ammonium phosphate (NH₄H₂PO₄) 10045-89-3
 10049-21-5 12191-70-7, Sodium fluoride metaphosphate
 (Na₂F(PO₃)) 13011-54-6, Ammonium sodium phosphate ((NH₄)NaHPO₄)
 (in preparation of sodium iron fluorophosphate cathode
 materials for lithium-ion batteries)
 IT 1034495-99-2F, Iron lithium sodium fluoride
 phosphate (Fe(Li,Na)2F(PO₄))
 (mixed lithium/sodium iron fluorophosphate cathode
 materials for lithium-ion batteries)
 IT 418771-26-3P, Iron sodium fluoride phosphate (FeNaF(PO₄))
 477779-90-1P, Iron sodium fluoride phosphate (FeNa2F(PO₄))
 958636-40-3P, Iron sodium fluoride phosphate (FeNa1.5F(PO₄))
 1034496-00-8P, Iron sodium fluoride phosphate
 1034496-02-0P, Iron sodium fluoride phosphate
 (FeNa1.25F(PO₄)) 1034496-03-1P, Iron sodium fluoride
 phosphate (FeNa1.75F(PO₄))
 (sodium iron fluorophosphate cathode materials
 for lithium-ion batteries)

L76 ANSWER 5 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
 ACCESSION NUMBER: 2008:649750 HCAPLUS Full-text
 DOCUMENT NUMBER: 149:82606
 TITLE: Process for producing lithium iron phosphate
 cathode material in continuous
 vacuum rotary kiln
 INVENTOR(S): Yu, Weijie
 PATENT ASSIGNEE(S): Peop. Rep. China
 SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 8pp.
 CODEN: CNXXEV
 DOCUMENT TYPE: Patent
 LANGUAGE: Chinese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
CN 101186289	A	20080528	CN 2006-10149109	20061117
			<--	
PRIORITY APPLN. INFO.:			CN 2006-10149109	20061117
			<--	

ED Entered STN: 02 Jun 2008

AB The invention is characterized in that: (1) a kind of continuous vacuum rotary kiln is used with continuous feeding and continuous discharging, (2) material is rotating and moving forward with rotating barrel of rotary kiln for uniform heating during calcination, and (3) completely dynamic high efficiency calcination is realized. The rotary kiln consists of a spiral feeder, a receiving hopper, a receiving bin, a feeding bin, a reception bin, a furnace body, a gas inlet, a gas outlet, etc. The title process comprises weighing, proportioning, pulverizing mech., ball milling, pressing into pills, calcining, pulverizing mech., ball-milling to coat conductive carbon, detecting and packing. The invention has the advantages such as low energy consumption, high efficiency, good quality of product, etc.

IT 411234-54-3P, Iron lithium phosphate 1033326-43-0P
 (process for production of lithium iron phosphate cathode
 material in continuous vacuum rotary kiln)

RN 411234-54-3 HCAPLUS

CN Phosphoric acid, iron lithium salt (9CI) (CA INDEX NAME)



●x Fe (x)

●x Li

RN 1033326-43-0 HCAPLUS

CN Iron lithium magnesium titanium phosphate (Fe0.98LiMg0.01Ti0.01(PO4))
(CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Ti	0.01	7440-32-6
Mg	0.01	7439-95-4
Li	1	7439-93-2
Fe	0.98	7439-89-6

IPCI C01B0025-45 [I,A]

IPCR C01B0025-45 [I,A]

CC 49-5 (Industrial Inorganic Chemicals)

Section cross-reference(s): 52

IT Size reduction

(crushing; process for production of lithium iron phosphate cathode material in continuous vacuum rotary kiln)

IT Secondary batteries

(lithium; process for production of lithium iron phosphate cathode material in continuous vacuum rotary kiln)

IT Ball milling

Cathodes

Coating process

Sintering

(process for production of lithium iron phosphate cathode material in continuous vacuum rotary kiln)

IT Kilns

(rotary; process for production of lithium iron phosphate cathode material in continuous vacuum rotary kiln)

IT 411234-54-3P, Iron lithium phosphate 1033326-43-0P

(process for production of lithium iron phosphate cathode material in continuous vacuum rotary kiln)

IT 516-03-0, Ferrous oxalate 554-13-2, Lithium carbonate 1309-42-8,

Magnesium hydroxide 7722-76-1, Ammonium dihydrogen phosphate

12026-28-7, Titanic acid 13453-80-0, Lithium dihydrogen phosphate

13463-67-7, Titanium dioxide, reactions

(process for production of lithium iron phosphate cathode material in continuous vacuum rotary kiln)

IT 7440-44-0, Carbon, uses

(process for production of lithium iron phosphate cathode material in continuous vacuum rotary kiln)

L76 ANSWER 6 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
 ACCESSION NUMBER: 2008:508653 HCAPLUS Full-text
 DOCUMENT NUMBER: 148:499757
 TITLE: Nonaqueous electrolyte secondary battery
 INVENTOR(S): Shirakata, Hironori; Hasumi, Koji; Akita, Hiroyuki; Donoue, Kazunori; Kida, Yoshinori
 PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan
 SOURCE: U.S. Pat. Appl. Publ., 17 pp.
 CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20080096098	A1	20080424	US 2007-976088	20071019
			<--	
JP 2008181850	A	20080807	JP 2007-136101	20070523
			<--	
KR 2008035466	A	20080423	KR 2007-104044	20071016
			<--	
CN 101165946	A	20080423	CN 2007-10163274	20071019
			<--	
PRIORITY APPLN. INFO.:			JP 2006-285283	A 20061019
			<--	
			JP 2006-350735	A 20061227
			<--	
			JP 2007-136101	T0 20070523

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STN: 25 Apr 2008
 AB A non-aqueous electrolyte secondary battery has a pos. electrode, a neg. electrode, and a non-aqueous electrolyte. The pos. electrode has a pos. electrode mixture layer containing a pos. electrode active material, a binder agent, and a conductive agent. The pos. electrode active material in the pos. electrode mixture layer contains an olivine-type lithium-containing metal phosphate represented by the general formula Li_xMPO_4 , where M is at least one element selected from the group consisting of Co, Ni, Mn, and Fe, and x is $0 < x < 1.3$. The conductive agent in the pos. electrode mixture layer is composed of a mixture of carbon particles and carbon fiber.
 IT 198782-39-7, Iron lithium phosphate ($\text{FeLiO}-1(\text{PO}_4)$)
 1019336-27-6, Iron lithium phosphate ($\text{FeLiO}-1.3(\text{PO}_4)$)
 (nonaq. electrolyte secondary battery)
 RN 198782-39-7 HCAPLUS
 CN Iron lithium phosphate ($\text{FeLiO}-1(\text{PO}_4)$) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
O4P	1		14265-44-2
Li	0 - 1		7439-93-2
Fe	1		7439-89-6

RN 1019336-27-6 HCAPLUS
 CN Iron lithium phosphate ($\text{FeLiO}-1.3(\text{PO}_4)$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	0 - 1.3	7439-93-2
Fe	1	7439-89-6

INCL 429094000; 429211000; 429221000; 429223000; 429224000; 429231800
 IPCI H01M0004-58 [I,A]; H01M0002-26 [I,A]
 IPCR H01M0004-58 [I,A]; H01M0002-26 [I,A]
 NCL 429/094.000; 429/211.000; 429/221.000; 429/223.000; 429/224.000;
 429/231.800; 429/231.950
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy
 Technology)
 IT Secondary batteries
 (lithium; nonaq. electrolyte secondary battery)
 IT Battery cathodes
 (nonaq. electrolyte secondary battery)
 IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 7782-42-5,
 Graphite, uses 21324-40-3, Lithium hexafluorophosphate
 198782-39-7, Iron lithium phosphate (FeLiO-1(PO4))
 1019336-27-6, Iron lithium phosphate (FeLiO-1.3(PO4))
 1021177-20-7, Cobalt lithium phosphate (CoLiO-1.3(PO4))
 1021177-21-8, Lithium nickel phosphate (LiO-1.3Ni(PO4))
 1021177-22-9, Lithium manganese phosphate (LiO-1.3Mn(PO4))
 (nonaq. electrolyte secondary battery)

L76 ANSWER 7 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
 ACCESSION NUMBER: 2007:1449084 HCAPLUS Full-text
 DOCUMENT NUMBER: 148:82133
 TITLE: Amorphous and partially amorphous nanoscale ion
 storage materials for batteries
 INVENTOR(S): Chiang, Yet-Ming; Pullen, Anthony E.; Meethong,
 Nonglak
 PATENT ASSIGNEE(S): A123Systems, Inc., USA
 SOURCE: U.S. Pat. Appl. Publ., 3/ pp., Cont.-in-part of
 U.S. Ser. No. 396,515.
 CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 4
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20070292747	A1	20071220	US 2006-607525	20061201
			<--	
US 20070031732	A1	20070208	US 2006-396515	20060403
			<--	
US 7939201	B2	20110510		
PRIORITY APPLN. INFO.:			US 2005-706273P	P 20050808
			<--	
			US 2005-741606P	P 20051202
			<--	
			US 2006-396515	A2 20060403
			<--	

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STN: 21 Dec 2007

AB Amorphous or partially amorphous nanoscale ion storage materials are provided.
 For example, lithium transition metal phosphate storage compds. are nanoscale

and amorphous or partially amorphous in an as-prepared state, or become amorphous or partially amorphous upon electrochem. intercalation or deintercalation by lithium. These nanoscale ion storage materials are useful for producing devices such as high energy and high power storage batteries.

IT 876064-87-8P, Iron lithium phosphate (FeLi_{0.95}(PO₄))
 918540-46-2P, Iron lithium phosphate (FeLi_{0.9}(PO₄))
 (amorphous and partially amorphous nanoscale ion storage materials for batteries)
 RN 876064-87-8 HCAPLUS
 CN Iron lithium phosphate (FeLi_{0.95}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	0.95	7439-93-2
Fe	1	7439-89-6

RN 918540-46-2 HCAPLUS
 CN Iron lithium phosphate (FeLi_{0.9}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	0.9	7439-93-2
Fe	1	7439-89-6

INCL 429052000; 423305000; 423306000; 429220000; 429221000; 429223000;
 429224000; 429231500; 429231800; 429231950
 IPCI H01M0004-40 [I,A]; C01B0025-26 [I,A]; H01M0004-50 [I,A]; H01M0004-58
 [I,A]; H01M0004-52 [I,A]; H01M0010-44 [I,A]
 IPCR H01M0004-40 [I,A]; C01B0025-26 [I,A]; H01M0004-02 [N,A]; H01M0004-136
 [I,A]; H01M0004-58 [I,A]; H01M0010-0525 [I,A]; H01M0010-36 [I,A];
 H01M0010-44 [I,A]
 NCL 429/052.000; 423/305.000; 423/306.000; 429/220.000; 429/221.000;
 429/223.000; 429/224.000; 429/231.500; 429/231.800; 429/231.950
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy
 Technology)
 Section cross-reference(s): 49
 IT Battery cathodes
 Secondary batteries
 Surface area
 (amorphous and partially amorphous nanoscale ion storage materials for batteries)
 IT 7439-93-2DP, Lithium, transition metal phosphate 15365-14-7P, Iron
 lithium phosphate FeLiPO₄ 697756-76-6P, Iron lithium phosphate
 FeLi_{0.5}PO₄ 876064-87-8P, Iron lithium phosphate
 (FeLi_{0.95}(PO₄)) 918540-46-2P, Iron lithium phosphate
 (FeLi_{0.9}(PO₄)) 960373-48-2P, Iron lithium manganese niobium
 phosphate (Fe_{0.3}Li_{0.99}Mn_{0.7}Nb_{0.01}(PO₄))
 (amorphous and partially amorphous nanoscale ion storage materials for batteries)
 OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS
 RECORD (1 CITINGS)

L76 ANSWER 8 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
 ACCESSION NUMBER: 2007:912347 HCAPLUS [Full-text](#)
 DOCUMENT NUMBER: 147:280852
 TITLE: Nanoscale ion storage materials

INVENTOR(S): Chiang, Yet-Ming; Gozdz, Antoni S.; Payne, Martin W.
 PATENT ASSIGNEE(S): A123 Systems, Inc., USA
 SOURCE: U.S. Pat. Appl. Publ., 49pp., Cont.-in-part of U.S. Ser. No. 396,515.
 CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 4
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20070190418	A1	20070816	US 2007-672931	20070208
US 20070031732	A1	20070208	US 2006-396515	20060403
US 7939201	B2	20110510		
WO 2008109209	A2	20080912	WO 2008-US52584	20080131
WO 2008109209	A3	20081204		
W:	AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW			
RW:	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AP, EA, EP, OA			
KR 2009109124	A	20091019	KR 2009-7018664	20080131
EP 2118949	A2	20091118	EP 2008-782740	20080131
R:	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LI, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR			
JP 2010517917	T	20100527	JP 2009-549177	20080131
CN 101669234	A	20100310	CN 2008-80009462	20090923
PRIORITY APPLN. INFO.:			US 2005-706273P	P 20050808
			US 2005-741606P	P 20051202
			US 2006-396515	A2 20060403
			US 2007-672931	A 20070208
			US 2007-888929P	P 20070208
			WO 2008-US52584	W 20080131

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STN: 17 Aug 2007

AB Nanoscale ion storage materials are provided that exhibit unique properties measurably distinct from their larger scale counterparts. For example, the nanoscale materials can exhibit increased electronic conductivity, improved electromech. stability, increased rate of intercalation, and/or an extended range of solid solution Useful nanoscale materials include alkaline

transition metal phosphates, such as LiMPO_4 , where M is one or more transition metals. The nanoscale ion storage materials are useful for producing devices such as high energy and high power storage batteries, battery-capacitor hybrid devices, and high rate electrochromic devices.

IT 714249-20-4P, Iron lithium phosphate ($\text{FeLi}_{0.99}(\text{PO}_4)$)
 876064-87-8P, Iron lithium phosphate ($\text{FeLi}_{0.95}(\text{PO}_4)$)
 (nanoscale ion storage materials)
 RN 714249-20-4 HCAPLUS
 CN Iron lithium phosphate ($\text{FeLi}_{0.99}(\text{PO}_4)$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	0.99	7439-93-2
Fe	1	7439-89-6

RN 876064-87-8 HCAPLUS
 CN Iron lithium phosphate ($\text{FeLi}_{0.95}(\text{PO}_4)$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	0.95	7439-93-2
Fe	1	7439-89-6

IT 411234-54-3, Iron lithium phosphate
 (nanoscale ion storage materials)
 RN 411234-54-3 HCAPLUS
 CN Phosphoric acid, iron lithium salt (9CI) (CA INDEX NAME)



●x Fe(x)

●x Li

INCL 429221000; 429231950; 429050000; 423306000
 IPCI H01M0004-58 [I,A]; H01M0010-44 [I,A]; C01B0025-45 [I,A]
 IPCR C01B0025-45 [I,A]; H01M0004-02 [N,A]; H01M0004-136 [I,A]; H01M0004-58 [I,A]; H01M0010-0525 [I,A]; H01M0010-36 [I,A]; H01M0010-44 [I,A]
 NCL 429/221.000; 423/306.000; 429/050.000; 429/231.950
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 74, 76
 IT Secondary batteries
 (lithium; nanoscale ion storage materials)
 IT Battery cathodes
 Electrochromic devices

Nanostructured materials
Open circuit potential
Surface area

(nanoscale ion storage materials)
IT 714249-20-4P, Iron lithium phosphate (FeLi_{0.99}(PO₄))
876064-87-8P, Iron lithium phosphate (FeLi_{0.95}(PO₄))
(nanoscale ion storage materials)
IT 7664-38-2D, Phosphoric acid, lithium transition metal compound
15365-14-7D, Iron lithium phosphate felipo₄, lithium-deficient
411234-54-3, Iron lithium phosphate
(nanoscale ion storage materials)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS
RECORD (1 CITINGS)

L76 ANSWER 9 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
ACCESSION NUMBER: 2007:328346 HCAPLUS Full-text
DOCUMENT NUMBER: 146:362058
TITLE: Manufacture of cathode active mass for secondary
nonaqueous electrolyte batteries
INVENTOR(S): Nakanishi, Shinji; Yoshizawa, Hiroshi; Okada,
Shigeto
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan;
Kyushu University
SOURCE: Jpn. Kokai Tokyo Koho, 19pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007073360	A	20070322	JP 2005-259604	20050907
			<--	
PRIORITY APPLN. INFO.:			JP 2005-259604	20050907
			<--	

ED Entered STN: 22 Mar 2007

AB The active mass is manufactured by mixing raw materials of Li₂MP_{0.4}F (M is ≥1 transition metal element selected from Fe, Co, Mn, and Ni); and fusing the raw material mixture

IT 484039-86-3P, Iron lithium fluoride phosphate
(FeLi₂F(PO₄))

(manufacture of cathode active mass containing lithium transition metal phosphate composites for secondary lithium batteries)

RN 484039-86-3 HCAPLUS

CN Iron lithium fluoride phosphate (FeLi₂F(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O4P	1	14265-44-2
Li	2	7439-93-2
Fe	1	7439-89-6

IT 411234-54-3, Iron lithium phosphate
(manufacture of cathode active mass containing lithium transition metal phosphate composites for secondary lithium batteries)

RN 411234-54-3 HCAPLUS

CN Phosphoric acid, iron lithium salt (9CI) (CA INDEX NAME)



● x Fe (x)

● x Li

IPCI H01M0004-58 [I,A]; H01M0010-40 [I,A]; C01B0025-45 [I,A]

IPCR H01M0004-58 [I,A]; C01B0025-45 [I,A]; H01M0010-40 [I,A]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Battery cathodes

(manufacture of cathode active mass containing lithium transition metal phosphate composites for secondary lithium batteries)

IT 13826-59-0P, Lithium manganese phosphate (LiMnPO₄) 484039-84-1P, Cobalt lithium fluoride phosphate (CoLi₂F(PO₄))

484039-86-3P, Iron lithium fluoride phosphate (FeLi₂F(PO₄)) 484039-91-0P, Lithium nickel fluoride phosphate (Li₂NiF(PO₄)) 484039-95-4P, Lithium manganese fluoride phosphate (Li₂MnF(PO₄))

(manufacture of cathode active mass containing lithium transition metal phosphate composites for secondary lithium batteries)

IT 1314-56-3, Phosphorus oxide (P₂O₅), reactions 1345-25-1, Iron oxide (FeO), reactions 7789-24-4, Lithium fluoride, reactions

12057-24-8, Lithium oxide (Li₂O), reactions 13824-63-0, Cobalt lithium phosphate (CoLiPO₄) 13977-83-8, Lithium nickel phosphate (LiNiPO₄) 411234-54-3, Iron lithium phosphate

(manufacture of cathode active mass containing lithium transition metal phosphate composites for secondary lithium batteries)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L76 ANSWER 10 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2007:286942 HCAPLUS Full-text

DOCUMENT NUMBER: 146:299360

TITLE: Cathode material for manufacturing a rechargeable battery

INVENTOR(S): Yang, Chih-Wei

PATENT ASSIGNEE(S): Aquire Energy Co., Ltd., Taiwan

SOURCE: U.S. Pat. Appl. Publ., 17pp., Cont.-in-part of U.S. Ser. No. 222,569.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 9

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20070059598	A1	20070315	US 2006-510096	20060825

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US 7700236          B2    20100420
US 20060257307      A1    20061116    US 2005-222569    20050909
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AT 385999           T     20080315    AT 2005-256174    20051003
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US 20070207385      A1    20070906    US 2007-747746    20070511
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US 7781100          B2    20100824
US 20070238021      A1    20071011    US 2007-764686    20070618
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US 7799457          B2    20100921
US 20080107967      A1    20080508    US 2007-940283    20071114
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US 7887954          B2    20110215
US 20080138710      A1    20080612    US 2007-940276    20071114
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PRIORITY APPLN. INFO.:    US 2005-222569    A2 20050909
                                     <--
                                     TW 2005-115023    A 20050510
                                     <--
                                     EP 2005-256174    A 20051003
                                     <--
                                     CN 2006-10080365    A 20060511
                                     <--
                                     US 2006-510096    A2 20060825
                                     <--
                                     US 2006-518805    A2 20060911
                                     <--
                                     US 2007-747746    A2 20070511
                                     <--
                                     US 2007-764629    A2 20070618

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ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

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ED  Entered STN: 16 Mar 2007
AB  A cathode material having olivine or NASICON structures and includes
micrometer-sized secondary particles having a particle size of 1-50 μm. Each
of the micrometer-sized secondary particles is composed of crystalline
nanometer-sized primary particles of a metal compound having a particle size
of 10-500 nm. The metal compound has a formula A3M2y(PO4)3 with A being a
Group IA, IIA, or IIIA element, M being a 2nd metal element from Groups IIA,
IIIA, or a transition element, and 0<x≤1.2, and 0<y≤1.6. Carbon particles
adhere to the surface of the crystalline nanometer-sized primary particles.
The cathode material has a BET sp. surface area of 5-100 m2/g. The cathode
material is coated on an electrode plate. The cathode material contains a
binder, such as styrene-butadiene rubber or polyvinylidene fluoride. The
cathode material contains a thickener, especially CM-cellulose.
IT  928163-03-5P
(cathode material; cathode
material for manufacturing rechargeable battery)
RN  928163-03-5 HCAPLUS
CN  Aluminum iron lithium magnesium phosphate (Al0.01Fe0.98LiMg0.01(PO4))
(CA INDEX NAME)

```

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	0.01	7439-95-4
Li	1	7439-93-2

Fe		0.98		7439-89-6
Al		0.01		7429-90-5

INCL 429209000; 423306000; 429217000; 252182100; 429232000

IPCI C01B0025-26 [I,A]; H01M0004-02 [I,A]; H01M0004-62 [I,A]; H01M0004-58 [I,A]; H01M0004-36 [I,A]; C01B0025-45 [N,A]

IPCR C01B0025-26 [I,A]; H01M0004-02 [N,A]; H01M0004-136 [I,A]; H01M0004-58 [I,A]; H01M0004-62 [I,A]; C01B0025-45 [N,A]; H01M0004-36 [I,A]

NCL 429/209.000; 252/182.100; 423/306.000; 429/217.000; 429/232.000; 429/218.100; 429/220.000; 429/221.000; 429/223.000; 429/224.000; 429/229.000; 429/231.500; 429/231.600; 429/231.900; 429/231.950

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 49

ST cathode material rechargeable battery lithium ferrous phosphate

IT Styrene-butadiene rubber, uses (cathode containing; cathode material for manufacturing rechargeable battery)

IT Battery cathodes NASICONs Secondary batteries (cathode material for manufacturing rechargeable battery)

IT Fluoropolymers, uses (cathode material for manufacturing rechargeable battery)

IT Charcoal (cathode material for manufacturing rechargeable battery)

IT 7440-44-0, Carbon, uses (anode, cathode containing; cathode material for manufacturing rechargeable battery)

IT 9004-32-4, Carboxymethyl cellulose (cathode containing; cathode material for manufacturing rechargeable battery)

IT 24937-79-9, Polyvinylidene fluoride (cathode containing; cathode material for manufacturing rechargeable battery)

IT 50-99-7, Glucose, processes 57-50-1, Sucrose, processes 77-92-9, Citric acid, processes 144-62-7, Oxalic acid, processes (cathode material for manufacturing rechargeable battery)

IT 1310-65-2, Lithium hydroxide 7439-89-6, Iron, reactions 7446-70-0, Aluminum chloride, reactions 7664-38-2, Phosphoric acid, reactions 7705-08-0, Ferric chloride, reactions 7786-30-3, Magnesium chloride, reactions 10421-48-4, Ferric nitrate (cathode material for manufacturing rechargeable battery)

IT 15365-14-7P, Iron lithium phosphate felipo4 928163-03-5P (cathode material; cathode material for manufacturing rechargeable battery)

IT 7429-90-5, Aluminum, uses (electrode plate; cathode material for manufacturing rechargeable battery)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate (electrolyte containing; cathode material for manufacturing rechargeable battery)

IT 21324-40-3, Lithium hexafluorophosphate

(electrolyte; cathode material for manufacturing rechargeable battery)

IT 9003-55-8 (styrene-butadiene rubber, cathode containing; cathode material for manufacturing rechargeable battery)

OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

L76 ANSWER 11 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
 ACCESSION NUMBER: 2007:215499 HCAPLUS Full-text
 DOCUMENT NUMBER: 147:238686
 TITLE: Electrochemical properties of LiFe1-xMgxPO4 for cathode of lithium ion battery
 AUTHOR(S): Zhang, Bao; Li, Xin-hai; Luo, Wen-bin; Wang, Zhi-xing
 CORPORATE SOURCE: School of Metallurgy Science and Engineering, Central South University, Changsha, 410083, Peop. Rep. China
 SOURCE: Zhongnan Daxue Xuebao, Ziran Kexueban (2006), 37(6), 1094-1097
 CODEN: ZDXZAC; ISSN: 1672-7207
 PUBLISHER: Zhongnan Daxue Xuebao Ziran Kexueban Bianji Weiyuanhui
 DOCUMENT TYPE: Journal
 LANGUAGE: Chinese
 ED Entered STN: 28 Feb 2007
 AB LiFe1-xMgxPO4 (x = 0.01, 0.05, 0.10, 0.15) was synthesized by doping Mg into LiFePO4. The effect of the doping amount of Mg on the electrochem. performances of LiFe1-xMgxPO4 was investigated. The results showed that the Mg-doped LiFePO4 had higher charge and discharge capacities and better cycle performance than LiFePO4. The initial specific discharge capacity of LiFe0.85Mg0.15PO4 was 125.6 mA · h/g, and the discharge capacity remained 123.0 mA · h/g after 6 cycles. The electronic conductivity could be increased by a factor of 1 x 106 after doping Mg. Compared with LiFePO4, the electrochem. performance of Mg-doped sample were greatly improved.
 IT 411234-54-3, Iron lithium phosphate (electrochem. properties of LiFe1-xMgxPO4 for cathode of lithium ion battery)
 RN 411234-54-3 HCAPLUS
 CN Phosphoric acid, iron lithium salt (9CI) (CA INDEX NAME)



●x Fe(x)

●x Li

IT 331622-66-3P, Iron lithium magnesium phosphate
 (Fe0.85LiMg0.15(PO4)) 478819-92-0P, Iron lithium magnesium

phosphate (Fe0.99LiMg0.01(P04)) 643752-34-5P, Iron lithium
magnesium phosphate (Fe0.95LiMg0.05(P04))
(electrochem. properties of LiFe1-xMgxPO4 for cathode of lithium
ion battery)

RN 331622-66-3 HCAPLUS

CN Iron lithium magnesium phosphate (Fe0.85LiMg0.15(P04)) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	0.15	7439-95-4
Li	1	7439-93-2
Fe	0.85	7439-89-6

RN 478819-92-0 HCAPLUS

CN Iron lithium magnesium phosphate (Fe0.99LiMg0.01(P04)) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	0.01	7439-95-4
Li	1	7439-93-2
Fe	0.99	7439-89-6

RN 643752-34-5 HCAPLUS

CN Iron lithium magnesium phosphate (Fe0.95LiMg0.05(P04)) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	0.05	7439-95-4
Li	1	7439-93-2
Fe	0.95	7439-89-6

CC 52-2 (Electrochemical, Radiational, and Thermal Energy
Technology)

IT Battery cathodes

Crystal structure

Electric conductivity

Heat treatment

(electrochem. properties of LiFe1-xMgxPO4 for cathode of lithium
ion battery)

IT 411234-54-3, Iron lithium phosphate

(electrochem. properties of LiFe1-xMgxPO4 for cathode of lithium
ion battery)

IT 331622-66-3P, Iron lithium magnesium phosphate
(Fe0.85LiMg0.15(P04)) 478819-92-0P, Iron lithium magnesium
phosphate (Fe0.99LiMg0.01(P04)) 632286-77-2P 643752-34-5P
, Iron lithium magnesium phosphate (Fe0.95LiMg0.05(P04))
(electrochem. properties of LiFe1-xMgxPO4 for cathode of lithium
ion battery)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS
RECORD (1 CITINGS)

L76 ANSWER 12 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
 ACCESSION NUMBER: 2007:146728 HCAPLUS Full-text
 DOCUMENT NUMBER: 146:209794
 TITLE: Nanoscale ion storage materials
 INVENTOR(S): Chiang, Yet-Ming; Gozdz, Antoni S.; Payne, Martin W.
 PATENT ASSIGNEE(S): A123 Systems, Inc., USA
 SOURCE: U.S. Pat. Appl. Publ., 38 pp.
 CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 4
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20070031732	A1	20070208	US 2006-396515	20060403
US 7939201	B2	20110510	<--	
WO 2008039170	A2	20080403	WO 2006-0530579	20060803
WO 2008039170	A3	20081113	<--	
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, ME, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW			
RW:	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AP, EA, EP, OA			
EP 1938402	A2	20080702	EP 2006-851633	20060803
R:	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, AL, BA, HR, MK, RS			
JP 2009516631	T	20090423	JP 2008-536570	20060803
WO 2007064934	A2	20070607	WO 2006-US46085	20061201
WO 2007064934	A3	20080515	<--	
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW			
RW:	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AP, EA, EP, OA			
US 20070292747	A1	20071220	US 2006-607525	20061201
EP 1972018	A2	20080924	EP 2006-844738	20061201
			<--	

R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,
 IE, IS, IT, LI, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK,
 TR, AL, BA, HR, MK, RS

JP 2009518262	T	20090507	JP 2008-543508	20061201
			<--	
US 20070190418	A1	20070816	US 2007-672931	20070208
			<--	
KR 2008045170	A	20080522	KR 2008-7005568	20080306
			<--	
CN 101427402	A	20090506	CN 2006-80035978	20080328
			<--	
KR 2008074208	A	20080812	KR 2008-7016190	20080702
			<--	
CN 101361210	A	20090204	CN 2006-80051496	20080721
			<--	
PRIORITY APPLN. INFO.:			US 2005-706273P	P 20050808
			<--	
			US 2005-741606P	P 20051202
			<--	
			US 2006-396515	A 20060403
			<--	
			WO 2006-US30579	W 20060803
			<--	
			WO 2006-US46085	W 20061201
			<--	

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STN: 09 Feb 2007

AB Nanoscale ion storage materials are provided that exhibit unique properties measurably distinct from their larger scale counterparts. For example, the nanoscale materials can exhibit increased electronic conductivity, improved electromech. stability, increased rate of intercalation, and/or an extended range of solid solution Useful nanoscale materials include alkaline transition metal phosphates, such as LiMPO₄, where M is one or more transition metals. The nanoscale ion storage materials are useful for producing devices such as high energy and high power storage batteries, battery-capacitor hybrid devices, and high rate electrochromic devices.

IT 714249-20-4P, Iron lithium phosphate (FeLi_{0.99}(PO₄))
 876064-87-8P, Iron lithium phosphate (FeLi_{0.95}(PO₄))
 (nanoscale ion storage materials)

RN 714249-20-4 HCAPLUS

CN Iron lithium phosphate (FeLi_{0.99}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	0.99	7439-93-2
Fe	1	7439-89-6

RN 876064-87-8 HCAPLUS

CN Iron lithium phosphate (FeLi_{0.95}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	0.95	7439-93-2
Fe	1	7439-89-6

IT 411234-54-3

(nanoscale ion storage materials)

RN 411234-54-3 HCAPLUS

CN Phosphoric acid, iron lithium salt (9CI) (CA INDEX NAME)



●x Fe(x)

●x Li

INCL 429231950; 423306000

IPCI H01M0004-58 [I,A]; C01B0025-45 [I,A]; H01M0004-58 [I,A]

IPCR C01B0025-45 [I,A]; H01M0004-02 [N,A]; H01M0004-136 [I,A]; H01M0004-58 [I,A]; H01M0010-0525 [I,A]; H01M0010-36 [I,A]

NCL 429/231.950; 423/306.000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 49, 74, 76

IT Battery cathodes

Electrochromic devices

Primary batteries

(nanoscale ion storage materials)

IT 15365-14-7P, Iron lithium phosphate felipo4 714249-20-4P,

Iron lithium phosphate (FeLi0.99(PO4)) 876064-87-8P, Iron

lithium phosphate (FeLi0.95(PO4))

(nanoscale ion storage materials)

IT 110213-39-3, Lithium titanium phosphate 411234-54-3

471294-34-5 471294-35-6 471294-38-9 471294-40-3 471294-47-0

(nanoscale ion storage materials)

OS.CITING REF COUNT: 5 THERE ARE 5 CAPLUS RECORDS THAT CITE THIS RECORD (5 CITINGS)

L76 ANSWER 13 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2006:786237 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 145:400831

TITLE: Small Polaron Hopping in Li_xFePO₄ Solid Solutions: Coupled Lithium-Ion and Electron Mobility

AUTHOR(S): Ellis, Brian; Perry, Laura K.; Ryan, Dominic H.; Nazar, L. F.

CORPORATE SOURCE: University of Waterloo, Waterloo, ON, N2L 3G1, Can.

SOURCE: Journal of the American Chemical Society (2006), 128(35), 11416-11422

CODEN: JACSAT; ISSN: 0002-7863

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 10 Aug 2006

AB Transition metal phosphates such as LiFePO₄ are promising electrode materials for Li-ion batteries because of their energy storage capacity combined with

electrochem. and thermal stability. A key issue in these materials is to unravel the factors governing electron and ion transport within the lattice. Li extraction from LiFePO_4 results in a 2-phase mixture with FePO_4 that limits power characteristics owing to low mobility of the phase boundary. This boundary is a consequence of low solubility of the parent phases, and its mobility is impeded by slow migration of the charge carriers. In principle, these limitations can be diminished in a solid solution, Li_xFePO_4 . Electron delocalization in the solid solution phases formed at elevated temperature is due to rapid small polaron hopping and is unrelated to the band gap. Exptl. evidence for a correlation between electron and Li delocalization events suggests that they are coupled. The frequency sensitivity of Moessbauer measurements provides direct insight into the electron hopping rate.

IT 411234-54-3, Iron lithium phosphate
(small polaron hopping in Li_xFePO_4 solid solns. - coupled lithium-ion and electron mobility)
RN 411234-54-3 HCAPLUS
CN Phosphoric acid, iron lithium salt (9CI) (CA INDEX NAME)



●x Fe(x)

●x Li

IT 911448-76-5, Iron lithium phosphate ($\text{FeLi}_{0.55}(\text{PO}_4)$)
(small polaron hopping in Li_xFePO_4 solid solns. - coupled lithium-ion and electron mobility)
RN 911448-76-5 HCAPLUS
CN Iron lithium phosphate ($\text{FeLi}_{0.55}(\text{PO}_4)$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	0.55	7439-93-2
Fe	1	7439-89-6

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 65, 76

IT Battery cathodes

(small polaron hopping in Li_xFePO_4 cathode material for lithium batteries)

IT 411234-54-3, Iron lithium phosphate
(small polaron hopping in Li_xFePO_4 solid solns. - coupled lithium-ion and electron mobility)

IT 729612-48-0, Iron lithium phosphate ($\text{FeLi}_{0.25}(\text{PO}_4)$) 729612-50-4, Iron lithium phosphate ($\text{FeLi}_{0.75}(\text{PO}_4)$) 911448-76-5, Iron lithium phosphate ($\text{FeLi}_{0.55}(\text{PO}_4)$)
(small polaron hopping in Li_xFePO_4 solid solns. - coupled

lithium-ion and electron mobility)
 OS.CITING REF COUNT: 57 THERE ARE 57 CAPLUS RECORDS THAT CITE THIS
 RECORD (57 CITINGS)
 REFERENCE COUNT: 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE
 RE FORMAT

L76 ANSWER 14 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
 ACCESSION NUMBER: 2006:484617 HCAPLUS Full-text
 DOCUMENT NUMBER: 145:400782
 TITLE: A new insight into the LiFePO₄ delithiation
 process
 AUTHOR(S): Lemos, V.; Guerini, S.; Mendes Filho, J.; Lala, S.
 M.; Montoro, L. A.; Rosolen, J. M.
 CORPORATE SOURCE: Departamento de Fisica, Centro de Ciencias,
 Universidade Federal do Ceara, Ceara, 60455-970,
 Brazil
 SOURCE: Solid State Ionics (2006), 177(11-12),
 1021-1025
 CODEN: SSIOD3; ISSN: 0167-2738
 PUBLISHER: Elsevier B.V.
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 ED Entered STN: 25 May 2006

AB Raman and FTIR measurements of Li_xM_{0.03}Fe_{0.97}PO₄, M = Cr, Cu, Al, Ti were
 performed. The spectra of delithiated samples, for a low content of Li, are
 practically the same as those of LiFePO₄. For a high content in Li the
 spectra repeat that of FePO₄. In the case of the Li_{0.11}FePO₄ the spectra
 cannot be reproduced by the superposition of the end member profiles. An
 addnl. broad band contribution is present in Raman and IR spectra, probably
 due to the disordered structure of the mixture. The accepted 2-phase model for
 the delithiation process in LiFePO₄ is incorrect and the model should be
 revised to include the new phase as detected here for a particular level of Li
 extraction close to that of complete oxidation of the Fe²⁺ ions to Fe³⁺.

IT 865443-06-7, Iron lithium phosphate (FeLi_{0.11}(PO₄))
 (delithiation of LiFePO₄ cathode material for
 lithium batteries)

RN 865443-06-7 HCAPLUS

CN Iron lithium phosphate (FeLi_{0.11}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O4P	1	14265-44-2
Li	0.11	7439-93-2
Fe	1	7439-89-6

CC 52-2 (Electrochemical, Radiational, and Thermal Energy
 Technology)

Section cross-reference(s): 72

ST iron lithium phosphate cathode delithiation lithium battery

IT Battery cathodes
 (delithiation of LiFePO₄ cathode material for
 lithium batteries)

IT Secondary batteries
 (lithium; delithiation of LiFePO₄ cathode
 material for lithium batteries)

IT Intercalation
 (retro, electrochem.; delithiation of LiFePO₄ cathode
 material for lithium batteries)

IT 15365-14-7, Iron lithium phosphate (FeLiPO4)
(delithiation of LiFePO4 cathode material for
lithium batteries)

IT 7439-93-2, Lithium, processes 865443-06-7, Iron lithium
phosphate (FeLi0.11(PO4)) 865443-10-3, Chromium iron lithium
phosphate (Cr0.03Fe0.97Li0.04(PO4)) 865443-11-4D, Chromium iron
lithium phosphate (Cr0.03Fe0.97Li0.05(PO4)), lithium deficient
911379-23-2, Copper iron lithium phosphate (Cu0.03Fe0.97Li(PO4))
911379-24-3, Iron lithium titanium phosphate (Fe0.97LiTi0.03(PO4))
911379-25-4, Chromium iron lithium phosphate (Cr0.03Fe0.97Li(PO4))
911379-26-5, Aluminum iron lithium phosphate (Al0.03Fe0.97Li(PO4))
911379-27-6D, Copper iron lithium phosphate (Cu0.03Fe0.97Li0.05(PO4)),
lithium deficient 911379-28-7D, Iron lithium titanium phosphate
(Fe0.97Li0.05Ti0.03(PO4)), lithium deficient 911379-30-1D, Aluminum
iron lithium phosphate (Al0.03Fe0.97Li0.05(PO4)), lithium deficient
(delithiation of LiFePO4 cathode material for
lithium batteries)

OS.CITING REF COUNT: 11 THERE ARE 11 CAPLUS RECORDS THAT CITE THIS
RECORD (11 CITINGS)

REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN THE
RE FORMAT

L76 ANSWER 15 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2006:443021 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 144:436133

TITLE: Lithium secondary batteries having wet-stable
oxide or nitride-based ionic conductors and their
anodes

INVENTOR(S): Ukaji, Masaya; Mino, Shinji; Shibano, Yasuyuki;
Ito, Shuji

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 18 pp.
CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2006120337	A	20060511	JP 2004-304089	20041019
			<--	
PRIORITY APPLN. INFO.:			JP 2004-304089	20041019
			<--	

ED Entered STN: 12 May 2006

AB The anodes consist of Li-precipitating conductive substrates and Li ion-
conductive layers represented by $Lx1P_{Ty}10z1$ or $Lx2M_{Oy}2Nz2$ [$T = Ti, V, Cr, Mn,$
 $Fe, Co, Ni, Cu, Zr, Nb, Mo, Ru, Ag, Ta, W, Pt,$ and/or Au ; $2.0 \leq x1 \leq 7.0$; 0.01
 $\leq y1 \leq 1.0$; $3.5 \leq z1 \leq 8.0$; $M = Si, B, Ge, Al, C, Ga,$ and/or S ; plural range
sets of ($x2, y2, z2$) are given] and being formed on the substrate surface.
Lithium secondary batteries employing the anodes suppress rise in anode
impedance and show long cycle life.

IT 782495-50-5P, Iron lithium oxide phosphate
(Fe0.2Li2.800.17(PO4))
(anodes; manufacture of lithium secondary batteries having wet-stable
oxide or nitride-based ionic conductors)

RN 782495-50-5 HCAPLUS

CN Iron lithium oxide phosphate (Fe0.2Li2.800.17(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.17	17778-80-2
O4P	1	14265-44-2
Li	2.8	7439-93-2
Fe	0.2	7439-89-6
IPCI	H01M0004-02 [I,A]; H01M0004-40 [I,A]; H01M0004-62 [I,A]; H01M0010-40 [I,A]	
IPCR	H01M0004-02 [I,A]; H01M0004-40 [I,A]; H01M0004-62 [I,A]; H01M0010-40 [I,A]	
CC	52-2 (Electrochemical, Radiational, and Thermal Energy Technology)	
IT	Secondary batteries (button-type; manufacture of lithium secondary batteries having wet-stable oxide or nitride-based ionic conductors)	
IT	Secondary batteries (lithium; manufacture of lithium secondary batteries having wet-stable oxide or nitride-based ionic conductors)	
IT	782495-23-2P, Lithium titanium metaphosphate oxide (Li ₂ .8Ti _{0.2} (PO ₃) _{00.9}) 782495-24-3P, Lithium vanadium metaphosphate oxide (Li ₂ .8V _{0.2} (PO ₃) _{00.9}) 782495-25-4P, Chromium lithium metaphosphate oxide (Cr _{0.2} Li _{2.8} (PO ₃) _{00.9}) 782495-26-5P, Lithium manganese metaphosphate oxide (Li ₂ .8Mn _{0.2} (PO ₃) _{00.9}) 782495-27-6P, Iron lithium metaphosphate oxide (Fe _{0.2} Li _{2.8} (PO ₃) _{00.9}) 782495-28-7P, Cobalt lithium metaphosphate oxide (Co _{0.2} Li _{2.8} (PO ₃) _{00.9}) 782495-29-8P, Lithium nickel metaphosphate oxide (Li ₂ .8Ni _{0.2} (PO ₃) _{00.9}) 782495-30-1P, Copper lithium metaphosphate oxide (Cu _{0.2} Li _{2.8} (PO ₃) _{00.9}) 782495-31-2P, Lithium zirconium metaphosphate oxide (Li ₂ .8Zr _{0.2} (PO ₃) _{00.9}) 782495-32-3P, Lithium niobium metaphosphate oxide (Li ₂ .8Nb _{0.2} (PO ₃) _{00.9}) 782495-33-4P, Lithium molybdenum metaphosphate oxide (Li ₂ .8Mo _{0.2} (PO ₃) _{00.9}) 782495-34-5P, Lithium ruthenium metaphosphate oxide (Li ₂ .8Ru _{0.2} (PO ₃) _{00.9}) 782495-35-6P, Lithium silver metaphosphate oxide (Li ₂ .8Ag _{0.2} (PO ₃) _{00.9}) 782495-36-7P, Lithium tantalum metaphosphate oxide (Li ₂ .8Ta _{0.2} (PO ₃) _{00.9}) 782495-37-8P, Lithium tungsten metaphosphate oxide (Li ₂ .8W _{0.2} (PO ₃) _{00.9}) 782495-38-9P, Lithium platinum metaphosphate oxide (Li ₂ .8Pt _{0.2} (PO ₃) _{00.9}) 782495-39-0P, Gold lithium metaphosphate oxide (Au _{0.2} Li _{2.8} (PO ₃) _{00.9}) 782495-41-4P, Lithium tungsten metaphosphate oxide (Li ₂ .8W _{0.01} (PO ₃) _{00.9}) 782495-42-5P, Lithium tungsten metaphosphate oxide (Li ₂ .8W _{0.05} (PO ₃) _{00.9}) 782495-43-6P, Lithium tungsten metaphosphate oxide (Li ₂ .8W _{0.1} (PO ₃) _{00.9}) 782495-44-7P, Lithium tungsten metaphosphate oxide (Li ₂ .8W _{0.5} (PO ₃) _{00.9}) 782495-47-0P, Lithium vanadium oxide phosphate (Li ₂ .8V _{0.200.4} (PO ₄)) 782495-48-1P, Chromium lithium oxide phosphate (Cr _{0.2} Li _{2.800.2} (PO ₄)) 782495-49-2P, Lithium manganese oxide phosphate (Li ₂ .8Mn _{0.200.3} (PO ₄)) 782495-50-5P, Iron lithium oxide phosphate (Fe _{0.2} Li _{2.800.17} (PO ₄)) 782495-51-6P, Cobalt lithium oxide phosphate (Co _{0.2} Li _{2.800.17} (PO ₄)) 782495-52-7P, Lithium nickel oxide phosphate (Li ₂ .8Ni _{0.200.1} (PO ₄)) 782495-53-8P, Copper lithium oxide phosphate (Cu _{0.2} Li _{2.800.1} (PO ₄)) 782495-54-9P, Lithium zirconium oxide phosphate (Li ₂ .8Zr _{0.200.3} (PO ₄)) 782495-55-0P, Lithium niobium oxide phosphate (Li ₂ .8Nb _{0.200.4} (PO ₄)) 782495-56-1P, Lithium molybdenum oxide phosphate (Li ₂ .8Mo _{0.200.5} (PO ₄)) 782495-57-2P, Lithium silver phosphate (Li ₂ .8Ag _{0.2} (PO ₄)) 782495-58-3P, Lithium tantalum oxide phosphate (Li ₂ .8Ta _{0.200.4} (PO ₄)) 782495-59-4P, Lithium tungsten oxide phosphate (Li ₂ .8W _{0.200.5} (PO ₄)) 782495-60-7P, Lithium titanium oxide phosphate (Li ₄ Ti _{10.250} (PO ₄)) 782495-61-8P, Lithium vanadium oxide phosphate (Li ₃ .75V _{0.250} (PO ₄))	

782495-62-9P, Chromium lithium oxide phosphate (Cr_{0.25}Li_{3.50}(PO₄))
 782495-63-0P, Lithium manganese oxide phosphate (Li_{3.25}Mn_{0.250}(PO₄))
 782495-64-1P, Lithium niobium oxide phosphate (Li_{3.75}Nb_{0.250}(PO₄))
 782495-65-2P, Lithium molybdenum oxide phosphate (Li_{3.5}Mo_{0.250}(PO₄))
 782495-66-3P, Lithium tantalum oxide phosphate (Li_{3.75}Ta_{0.250}(PO₄))
 782495-67-4P, Lithium tungsten oxide phosphate (Li_{3.5}W_{0.250}(PO₄))
 782495-69-6P, Lithium tungsten oxide phosphate (Li_{3.02}W_{0.0100.04}(PO₄))
 782495-70-9P, Lithium tungsten oxide phosphate (Li_{3.2}W_{0.100.4}(PO₄))
 782495-72-1P, Lithium tungsten oxide phosphate (Li_{3.66}W_{0.3301.32}(PO₄))
 782495-74-3P, Lithium tungsten oxide phosphate (Li₅W_{0.4}(PO₄))
 782495-76-5P, Lithium tungsten oxide phosphate (Li₇W_{2.08}(PO₄))
 816415-85-7P, Boron lithium nitride oxide (BLi_{0.8}N_{0.301.45})
 816416-34-9P, Germanium lithium nitride oxide (GeLi_{1.8}N_{0.302.45})
 816416-38-3P, Aluminum lithium nitride oxide (ALi_{1.8}N_{0.301.45})
 816416-40-7P, Aluminum lithium nitride oxide (ALi_{1.8}N_{0.303.45})
 816416-44-1P, Gallium lithium nitride oxide (GaLi_{0.8}N_{0.301.45})
 816416-46-3P, Lithium sulfur nitride oxide (Li_{1.8}S_{0.303.45})
 816416-50-9P, Boron lithium nitride oxide silicate
 (B_{0.5}Li_{2.3}N_{0.300.45}(SiO₄)_{0.5}) 816416-52-1P, Germanium lithium
 nitride oxide silicate (Ge_{0.5}Li_{3.8}N_{0.301.45}(SiO₄)_{0.5}) 816416-54-3P,
 Carbon lithium nitride oxide silicate (C_{0.5}Li_{2.8}N_{0.302.95}(SiO₄)_{0.5})
 816416-56-5P, Lithium silicon nitride oxide sulfate
 (Li_{2.8}Si_{0.5}N_{0.301.45}(SO₄)_{0.5}) 816416-58-7P, Germanium lithium borate
 nitride oxide (Ge_{0.5}Li_{2.3}(BO₃)_{0.5}N_{0.300.95}) 816416-60-1P, Aluminum
 lithium borate nitride oxide (Al_{0.5}Li_{2.8}(BO₃)_{0.5}N_{0.300.95})
 816416-62-3P, Boron lithium carbonate nitride oxide
 (B_{0.5}Li_{1.3}(CO₃)_{0.5}N_{0.300.45}) 816416-64-5P, Gallium lithium borate
 nitride oxide (Ga_{0.5}Li_{0.8}(BO₂)_{0.5}N_{0.300.45}) 816416-66-7P, Boron
 lithium nitride oxide sulfate (B_{0.5}Li_{1.3}N_{0.300.45}(SO₄)_{0.5})
 816416-68-9P 816416-70-3P, Germanium lithium nitride oxide sulfate
 (Ge_{0.5}Li_{2.8}N_{0.301.45}(SO₄)_{0.5}) 816416-72-5P, Aluminum gallium lithium
 nitride oxide (Al_{0.5}Ga_{0.5}Li_{2.8}N_{0.302.45}) 816416-74-7P, Carbon
 lithium nitride oxide sulfate (C_{0.5}Li_{1.8}N_{0.300.95}(SO₄)_{0.5})
 882681-95-0P, Lithium titanium oxide phosphate (Li_{2.8}Ti_{0.200.3}(PO₄))
 882682-19-1P, Lithium zirconium oxide phosphate (Li₄Zr_{0.250}(PO₄))
 882682-64-6P, Lithium silicon nitride oxide (Li_{1.8}Si_{0.502.15})
 884739-67-7P, Lithium silicon nitride oxide (Li_{1.8}Si_{0.502.45})
 885122-24-7P, Aluminum lithium nitride oxide (ALi_{1.8}N_{0.302.45})
 (anodes; manufacture of lithium secondary batteries having wet-stable
 oxide or nitride-based ionic conductors)
 IT 12190-79-3, Lithium cobaltate (LiCoO₂)
 (cathode active mass; manufacture of lithium secondary
 batteries having wet-stable oxide or nitride-based ionic
 conductors)

L76 ANSWER 16 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2006:399666 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 145:127452

TITLE: Room-temperature miscibility gap in Li₂FePO₄

AUTHOR(S): Yamada, Atsuo; Koizumi, Hiroshi; Nishimura,
 Shin-Ichi; Sonoyama, Noriyuki; Kanno, Ryoji;
 Yonemura, Masao; Nakamura, Tatsuya; Kobayashi, Yo

CORPORATE SOURCE: Department of Electronic Chemistry,
 Interdisciplinary Graduate School of Science and
 Engineering, Tokyo Institute of Technology,
 Midori, Yokohama, 226-8502, Japan

SOURCE: Nature Materials (2006), 5(5), 357-360

CODEN: NMAACR; ISSN: 1476-1122

PUBLISHER: Nature Publishing Group

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 02 May 2006

AB The rechargeable lithium-ion cell is an advanced energy-storage system. However, high cost, safety hazards, and chemical instability prohibit its use in large-scale applications. An alternative cathode material, LiFePO_4 , solves these problems, but has a kinetic problem involving strong electron/hole localization. One reason for this is believed to be the limited carrier d. in the fixed monovalent $\text{Fe}_3\text{PO}_4/\text{LiFe}_2\text{PO}_4$ two-phase electrode reaction in Li_xFePO_4 . Here, the authors provide exptl. evidence that Li_xFePO_4 , at room temperature, can be described as a mixture of the $\text{Fe}^{3+}/\text{Fe}^{2+}$ mixed-valent intermediate Li_xFePO_4 and $\text{Li}_{1-\beta}\text{FePO}_4$ phases. Using powder neutron diffraction, the site occupancy nos. for lithium in each phase were refined to be $\alpha = 0.05$ and $1-\beta = 0.89$. The corresponding solid solution ranges outside the miscibility gap ($0 < x < \alpha, 1-\beta < x < 1$) were detected by the anomaly in the configurational entropy, and also by the deviation of the open-circuit voltage from the constant equilibrium potential. These findings encourage further improvement of this important class of compds. at ambient temps.

IT 897030-96-5, Iron lithium phosphate ($\text{FeLi}_{0.05}(\text{PO}_4)$)

897030-97-6, Iron lithium phosphate ($\text{FeLi}_{0.89}(\text{PO}_4)$)

(room-temperature miscibility gap in lithium iron phosphate and use in secondary lithium battery cathodes)

RN 897030-96-5 HCAPLUS

CN Iron lithium phosphate ($\text{FeLi}_{0.05}(\text{PO}_4)$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	0.05	7439-93-2
Fe	1	7439-89-6

RN 897030-97-6 HCAPLUS

CN Iron lithium phosphate ($\text{FeLi}_{0.89}(\text{PO}_4)$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	0.89	7439-93-2
Fe	1	7439-89-6

IT 198782-39-7, Iron lithium phosphate ($\text{FeLi}_{0.1}(\text{PO}_4)$)

(room-temperature miscibility gap in lithium iron phosphate and use in secondary lithium battery cathodes)

RN 198782-39-7 HCAPLUS

CN Iron lithium phosphate ($\text{FeLi}_{0.1}(\text{PO}_4)$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	0 - 1	7439-93-2
Fe	1	7439-89-6

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 49, 68, 72, 75

ST miscibility iron lithium phosphate cathode phase compn mixed valence; secondary lithium battery cathode insertion phase

change iron phosphate

IT Carbon black, uses
(LION; room-temperature miscibility gap in Li_xFePO_4 and use in secondary lithium battery cathodes)

IT Insertion reaction
(electrochem.; room-temperature miscibility gap in Li_xFePO_4 and use in secondary lithium battery cathodes)

IT Secondary batteries
(lithium; room-temperature miscibility gap in Li_xFePO_4 and use in secondary lithium battery cathodes)

IT Calorimetry
(microcalorimetry; room-temperature miscibility gap in Li_xFePO_4 and use in secondary lithium battery cathodes)

IT Crystal structure determination methods
(neutron diffractometric; room-temperature miscibility gap in Li_xFePO_4 and use in secondary lithium battery cathodes)

IT Battery cathodes
Cyclic voltammetry
Electric potential
Miscibility
Open circuit potential
Phase composition
Phase diagram
(room-temperature miscibility gap in Li_xFePO_4 and use in secondary lithium battery cathodes)

IT Fluoropolymers, uses
(room-temperature miscibility gap in Li_xFePO_4 and use in secondary lithium battery cathodes)

IT 7439-93-2, Lithium, uses
(foil; room-temperature miscibility gap in lithium iron phosphate and use in secondary lithium battery cathodes)

IT 7429-90-5, Aluminum, uses
(mesh; room-temperature miscibility gap in lithium iron phosphate and use in secondary lithium battery cathodes)

IT 897030-96-5, Iron lithium phosphate ($\text{FeLi}_{0.05}(\text{PO}_4)$)
897030-97-6, Iron lithium phosphate ($\text{FeLi}_{0.89}(\text{PO}_4)$)
(room-temperature miscibility gap in lithium iron phosphate and use in secondary lithium battery cathodes)

IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate
9002-84-0, Polytetrafluoroethylene 21324-40-3, Lithium hexafluorophosphate 198782-39-7, Iron lithium phosphate ($\text{FeLi}_{0.1}(\text{PO}_4)$)
(room-temperature miscibility gap in lithium iron phosphate and use in secondary lithium battery cathodes)

IT 10045-86-0P, Iron phosphate (FePO_4)
(room-temperature miscibility gap in lithium iron phosphate and use in secondary lithium battery cathodes)

IT 15365-14-7P, Iron lithium phosphate (FeLiPO_4)
(room-temperature miscibility gap in lithium iron phosphate and use in secondary lithium battery cathodes)

IT 697756-76-6P, Iron lithium phosphate ($\text{FeLi}_{0.5}\text{PO}_4$)
(room-temperature miscibility gap in lithium iron phosphate and use in secondary lithium battery cathodes)

IT 10377-51-2, Lithium iodide 13826-86-3, Nitronium tetrafluoroborate
(room-temperature miscibility gap in lithium iron phosphate and use in secondary lithium battery cathodes)

OS.CITING REF COUNT: 121 THERE ARE 121 CAPLUS RECORDS THAT CITE THIS RECORD (122 CITINGS)

REFERENCE COUNT: 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR

THIS RECORD. ALL CITATIONS AVAILABLE IN THE
RE FORMAT

L76 ANSWER 17 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
ACCESSION NUMBER: 2006:337615 HCAPLUS Full-text
DOCUMENT NUMBER: 144:394637
TITLE: Solid electrolytes based on lithium hafnium
phosphate for active metal anode protection
INVENTOR(S): Nimon, Yevgeniy S.; De Jonghe, Lutgard C.; Visco,
Steven J.
PATENT ASSIGNEE(S): Polyplus Battery Company, USA
SOURCE: U.S. Pat. Appl. Publ., 16 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 20060078790	A1	20060413	US 2005-245472	20051005

PRIORITY APPLN. INFO.: US 2004-616325P P 20041005
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ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STN: 13 Apr 2006

AB Active metal electrochem. structure, in particular an active metal neg.
electrode (anode) protected with an ionically conductive protective
architecture incorporating a glassy, ceramic or glass-ceramic solid
electrolyte material based on lithium hafnium phosphate, and associated
electrochem. devices and methods, provides advantages over conventional
structures. The protective architecture prevents the active metal from
deleterious reaction with the environment on the other (cathode) side of the
architecture, which may include aqueous, air or organic liquid electrolytes
and/or electrochem. active materials.

IT 882691-96-5, Hafnium iron lithium phosphate
(can be conductive glass or ceramic electrolyte material; solid
electrolytes based on lithium hafnium phosphate for active metal
anode protection)

RN 882691-96-5 HCAPLUS

CN Hafnium iron lithium phosphate (CA INDEX NAME)

Component	Ratio	Component Registry Number
-----	-----	-----
O4P	x	14265-44-2
Hf	x	7440-58-6
Li	x	7439-93-2
Fe	x	7439-89-6

INCL 429137000; 429246000; 429303000

IPCI H01M0002-16 [I,A]; H01M0002-18 [I,A]

IPCR H01M0002-16 [I,A]; H01M0002-18 [I,A]

NCL 429/137.000; 429/246.000; 429/303.000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy
Technology)

Section cross-reference(s): 72

IT Halides
Nitrides

(contacts anode; solid electrolytes based on lithium hafnium

phosphate for active metal anode protection)

IT Battery electrolytes
Calcination
Cathodic protection
Ceramics
Glass ceramics
Grinding (size reduction)
Primary batteries
Primary battery separators
Secondary batteries
Secondary battery separators
(solid electrolytes based on lithium hafnium phosphate for active metal anode protection)

IT 882691-94-3, Chromium hafnium lithium phosphate 882691-95-4, Hafnium indium lithium phosphate 882691-96-5, Hafnium iron lithium phosphate 882691-97-6, Hafnium lithium tantalum phosphate 882691-98-7, Hafnium lithium scandium phosphate 882691-99-8, Hafnium lithium lutetium phosphate 882692-00-4, Hafnium lithium yttrium phosphate
(can be conductive glass or ceramic electrolyte material; solid electrolytes based on lithium hafnium phosphate for active metal anode protection)

IT 7550-35-8, Lithium bromide 7789-24-4, Lithium fluoride, uses 10377-51-2, Lithium iodide 12057-29-3, Trilithium phosphide 26134-62-3, Trilithium nitride 668998-68-3, Lithium phosphorus nitride oxide (LiPNO)
(contacts anode; solid electrolytes based on lithium hafnium phosphate for active metal anode protection)

OS.CITING REF COUNT: 5 THERE ARE 5 CAPLUS RECORDS THAT CITE THIS RECORD (5 CITINGS)

L76 ANSWER 18 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
ACCESSION NUMBER: 2006:216209 HCAPLUS Full-text
DOCUMENT NUMBER: 144:277160
TITLE: Cathode materials and their manufacture for secondary nonaqueous-electrolyte lithium ion batteries for automobiles
INVENTOR(S): Ito, Takanori; Saito, Takazane; Horie, Hideaki
PATENT ASSIGNEE(S): Nissan Motor Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 23 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2006066081	A	20060309	JP 2004-243799	20040824
			<--	
PRIORITY APPLN. INFO.:			JP 2004-243799	20040824
			<--	

ED Entered STN: 10 Mar 2006

AB The title cathode materials contain Li Fe phosphate compound particles on which a Li compound is attached. The title automobiles are equipped with secondary batteries or their assemblies using the above cathode materials. The title process comprises steps of firing a mixture containing an Fe compound chosen from Fe sulfate, Fe hydroxide, or their hydrate, a Li compound, and a P compound to give particles and then attaching a Li compound

on surfaces of the particles. The cathode materials suppress increase of internal resistance.

IT 877630-10-9P, Iron lithium oxide phosphate

(Fe0.98Li1.100.04(PO4)0.99)

(cathode; manufacture of cathodes containing coated lithium iron phosphate for secondary lithium ion batteries for automobiles)

RN 877630-10-9 HCAPLUS

CN Iron lithium oxide phosphate (Fe0.98Li1.100.04(PO4)0.99) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	0.04	17778-80-2
O4P	0.99	14265-44-2
Li	1.1	7439-93-2
Fe	0.98	7439-89-6

IPCI H01M0004-58 [I,A]; C01B0025-45 [I,A]; H01M0002-10 [I,A]; H01M0004-02 [I,A]; H01M0004-62 [I,A]; H01M0010-40 [I,A]

IPCR H01M0004-58 [I,A]; C01B0025-45 [I,A]; H01M0002-10 [I,A]; H01M0004-02 [I,A]; H01M0004-62 [I,A]; H01M0010-40 [I,A]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium iron phosphate particle coating cathode battery automobile

IT Electric vehicles

(automobiles; manufacture of cathodes containing coated lithium iron phosphate for secondary lithium ion batteries for automobiles)

IT Automobiles

(elec.; manufacture of cathodes containing coated lithium iron phosphate for secondary lithium ion batteries for automobiles)

IT Secondary batteries

(lithium; manufacture of cathodes containing coated lithium iron phosphate for secondary lithium ion batteries for automobiles)

IT Battery cathodes

(manufacture of cathodes containing coated lithium iron phosphate for secondary lithium ion batteries for automobiles)

IT 877630-10-9P, Iron lithium oxide phosphate

(Fe0.98Li1.100.04(PO4)0.99)

(cathode; manufacture of cathodes containing coated lithium iron phosphate for secondary lithium ion batteries for automobiles)

IT 107-15-3D, Ethylenediamine, compds. with lithium acetylde 546-89-4,

Lithium acetate 553-54-8, Lithium benzoate 553-91-3, Lithium oxalate 554-13-2, Lithium carbonate 1070-75-3D, Lithium acetylde (Li2(C2)), compds. with ethylenediamine 1310-65-2, Lithium hydroxide

2922-61-4, Lithium pyruvate 4485-12-5, Lithium stearate 7550-35-8, Lithium bromide 7789-24-4, Lithium fluoride,

uses 7790-69-4, Lithium nitrate 10377-48-7, Lithium sulfate 10377-52-3, Lithium phosphate 12057-17-9, Lithium manganese oxide

(LiMn2O4) 12190-79-3, Cobalt lithium oxide (CoLiO2) 30903-88-9, Tartaric acid lithium salt 159076-65-0, Lithium phosphorus silicon

oxide sulfide 236388-73-1, Lithium silicide sulfide 658038-32-5, Boron lithium oxide 852709-57-0, Lithium metaphosphate nitride oxide

(Li2.9(PO3)N0.3600.3) 877630-13-2, Boron lithium iodide

oxide

(coating; manufacture of cathodes containing coated lithium iron phosphate for secondary lithium ion batteries for automobiles)

IT 10124-31-9, Ammonium phosphate 10124-49-9, Iron sulfate
(lithium iron phosphate from; manufacture of cathodes containing
coated lithium iron phosphate for secondary lithium ion batteries
for automobiles)

L76 ANSWER 19 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2005:1090539 HCAPLUS Full-text

DOCUMENT NUMBER: 145:30729

TITLE: Lithium Insertion in the High-Pressure Polymorph
of FePO₄

AUTHOR(S): Arroyo-de Dompablo, M. E.; Gallardo-Amores, J. M.;
Amador, U.

CORPORATE SOURCE: Departamento de Química, Universidad San
Pablo-CEU, Madrid, Spain

SOURCE: Electrochemical and Solid-State Letters (
2005), 8(11), A564-A569

CODEN: ESLEF6; ISSN: 1099-0062

PUBLISHER: Electrochemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 12 Oct 2005

AB The high pressure (HP) polymorphs of quartz-FePO₄ and olivine-LiFePO₄
crystallize in structures related to the CrVO₄ structural-type. First
principles calcns. predict that HP-FePO₄ is electrochem. active at 3.6 V vs.
Li + /Li. Accordingly, electrochem. expts. followed by in situ synchrotron x-
ray diffraction prove that 0.22 Li ions can be inserted in HP-FePO₄ at 3 V The
inserted lithium ions were located, by Fourier difference anal., at the
initially empty tetrahedral sites of the structure, equivalent to those
occupied by lithium in HP-LiFePO₄. The lithium insertion reaction is
reversible although it presents a very slow kinetics.

IT 889360-82-1, Iron lithium phosphate (FeLi_{0.4}(PO₄))
(lithium insertion in high-pressure polymorph of FePO₄)

RN 889360-82-1 HCAPLUS

CN Iron lithium phosphate (FeLi_{0.4}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
=====+	=====+	=====
O4P	1	14265-44-2
Li	0 - 0.4	7439-93-2
Fe	1	7439-89-6

IT 889360-81-0P, Iron lithium phosphate (FeLi_{0.22}(PO₄))
(lithium insertion in high-pressure polymorph of FePO₄)

RN 889360-81-0 HCAPLUS

CN Iron lithium phosphate (FeLi_{0.22}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
=====+	=====+	=====
O4P	1	14265-44-2
Li	0.22	7439-93-2
Fe	1	7439-89-6

CC 52-2 (Electrochemical, Radiational, and Thermal Energy
Technology)

Section cross-reference(s): 75

ST lithium insertion high pressure polymorph iron phosphate ab initio;
density state energy secondary lithium battery cathode iron
phosphate

IT Ab initio methods
 Battery cathodes
 Density of states
 Electrochemistry
 Fermi level density of states
 Polymorphism (crystal)
 (lithium insertion in high-pressure polymorph of FePO₄)

IT Secondary batteries
 (lithium; lithium insertion in high-pressure polymorph of FePO₄)

IT 10045-86-0, Iron phosphate (FePO₄)
 (cathode; lithium insertion in high-pressure polymorph of FePO₄)

IT 889360-82-1, Iron lithium phosphate (FeLi_{0.4}(PO₄))
 (lithium insertion in high-pressure polymorph of FePO₄)

IT 889360-81-0P, Iron lithium phosphate (FeLi_{0.22}(PO₄))
 (lithium insertion in high-pressure polymorph of FePO₄)

OS.CITING REF COUNT: 11 THERE ARE 11 CAPLUS RECORDS THAT CITE THIS RECORD (11 CITINGS)

REFERENCE COUNT: 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L76 ANSWER 20 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2005:395668 HCAPLUS Full-text

DOCUMENT NUMBER: 142:449376

TITLE: Cathode material for secondary battery, its manufacture, and the battery

INVENTOR(S): Hatta, Naoki; Inaba, Toshikazu; Uchiyama, Izumi

PATENT ASSIGNEE(S): Mitsui Engineering & Shipbuilding Co., Ltd., Japan; Research Institute of Innovative Technology for the Earth

SOURCE: PCT Int. Appl., 83 pp.
 CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005041327	A1	20050506	WO 2004-JP15836	20041026
<--				
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, VZ, VC, VN, YU, ZA, ZM, ZW RM: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CA 2543851	A1	20050506	CA 2004-2543851	20041026
<--				
EP 1689011	A1	20060809	EP 2004-792957	20041026
<--				
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK				

CN 1883067	A	20061220	CN 2004-80031725	20041026
			<--	
CN 100573981	C	20091223		
JP 4656653	B2	20110323	JP 2005-515001	20041026
			<--	
KR 2006132576	A	20061221	KR 2006-7008069	20060426
			<--	
HK 1095431	A1	20100625	HK 2007-100905	20070125
			<--	
US 20080131777	A1	20080605	US 2008-577279	20080205
			<--	
PRIORITY APPLN. INFO.:			JP 2003-365790	A 20031027
			<--	
			WO 2004-JP15836	W 20041026
			<--	

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STIN: 09 May 2005

AB The material comprises a LiFePO_4 ($n = 0-1$) based cathode active mass and further contains ≥ 1 metal element, selected from group 4-6 and group 11-14, and a halo element having content ≥ 0.1 mol% (vs. P). The material is manufactured by mixing a LiFePO_4 raw material with a metal halide, containing the metal element(s); and compositing the metal element with the active mass by firing the mixture. The battery contains the above material.

IT 7447-39-4, Copper chloride (CuCl_2), uses
 7550-45-0, Titanium chloride (TiCl_4), uses
 7646-78-8, Tin chloride (SnCl_4), uses
 7646-85-7, Zinc chloride (ZnCl_2), uses
 7718-98-1, Vanadium chloride (VCl_3)
 7772-99-8, Tin chloride (SnCl_2), uses
 10025-73-7, Chromium chloride (CrCl_3)
 10241-05-1, Molybdenum chloride (MoCl_5)
 22519-64-8, Indium trichloride tetrahydrate
 (compos. and manufacture of cathode materials containing
 lithium iron composite phosphates for secondary lithium batteries)

RN 7447-39-4 HCAPLUS

CN Copper chloride (CuCl_2) (CA INDEX NAME)

Cl—Cu—Cl

RN 7550-45-0 HCAPLUS

CN Titanium chloride (TiCl_4) (T-4)- (CA INDEX NAME)



RN 7646-78-8 HCAPLUS

CN Stannane, tetrachloro- (CA INDEX NAME)



RN 7646-85-7 HCAPLUS
 CN Zinc chloride (ZnCl₂) (CA INDEX NAME)



RN 7718-98-1 HCAPLUS
 CN Vanadium chloride (VCl₃) (CA INDEX NAME)



RN 7772-99-8 HCAPLUS
 CN Tin chloride (SnCl₂) (CA INDEX NAME)



RN 10025-73-7 HCAPLUS
 CN Chromium chloride (CrCl₃) (CA INDEX NAME)



RN 10241-05-1 HCAPLUS
 CN Molybdenum chloride (MoCl₅) (CA INDEX NAME)



RN 22519-64-8 HCAPLUS

CN Indium chloride (InCl₃), tetrahydrate (8CI, 9CI) (CA INDEX NAME)● H₂O

IT 851190-38-0P, Iron lithium vanadium phosphate (Fe0.97Li1.01V0.01(PO₄)) 851190-39-1P, Chromium iron lithium phosphate (Cr0.01FeLi1.03(PO₄)) 851190-40-4P, Chromium iron lithium phosphate (Cr0.01FeLi0.99(PO₄)) 851190-41-5P, Copper iron lithium phosphate (Cu0.01Fe0.96Li(PO₄)) 851190-42-6P, Iron lithium zinc phosphate (Fe0.98Li1.04Zn0.01(PO₄)) 851190-43-7P, Indium iron lithium phosphate (In0.01Fe0.98Li1.01(PO₄)) 851190-44-8P, Iron lithium tin phosphate (Fe0.99Li0.97Sn0.01(PO₄)) 851190-45-9P, Iron lithium tin phosphate (Fe1.01Li1.03Sn0.01(PO₄)) 851190-46-0P, Iron lithium molybdenum phosphate (Fe1.01Li1.01Mo0.01(PO₄)) 851190-47-1P, Iron lithium titanium phosphate (Fe0.97LiTi0.01(PO₄)) 851190-48-2P, Iron lithium vanadium phosphate (Fe1.03Li1.02V0.01(PO₄)) 851190-49-3P, Chromium iron lithium phosphate (Cr0.01FeLi0.02Li1.03(PO₄)) 851190-50-6P, Chromium iron lithium phosphate (Cr0.01Fe0.97Li1.01(PO₄)) 851190-51-7P, Copper iron lithium phosphate (Cu0.01Fe0.97Li(PO₄)) 851190-53-9P, Iron lithium zinc phosphate (Fe1.01Li1.04Zn0.01(PO₄)) 851190-54-0P, Indium iron lithium phosphate (In0.01Fe0.99Li1.02(PO₄)) 851190-55-1P, Iron lithium tin phosphate (Fe1.01Li1.05Sn0.01(PO₄)) 851190-56-2P, Iron lithium tin phosphate (Fe1.01Li1.04Sn0.01(PO₄)) 851190-57-3P, Iron lithium molybdenum phosphate (Fe1.08Li1.03Mo0.01(PO₄)) 851190-58-4P, Iron lithium titanium phosphate (Fe1.04Li1.04Ti0.01(PO₄))

(comps. and manufacture of cathode materials containing lithium iron composite phosphates for secondary lithium batteries)

RN 851190-38-0 HCAPLUS

CN Iron lithium vanadium phosphate (Fe0.97Li1.01V0.01(PO₄)) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
=====	=====	=====
O4P	1	14265-44-2
V	0.01	7440-62-2
Li	1.01	7439-93-2
Fe	0.97	7439-89-6

RN 851190-39-1 HCAPLUS

CN Chromium iron lithium phosphate (Cr0.01FeLi1.03(PO₄)) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
=====	=====	=====

O4P		1		14265-44-2
Cr		0.01		7440-47-3
Li		1.03		7439-93-2
Fe		1		7439-89-6

RN 851190-40-4 HCAPLUS

CN Chromium iron lithium phosphate (Cr0.01Fe1.02Li0.99(PO4)) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O4P		1		14265-44-2
Cr		0.01		7440-47-3
Li		0.99		7439-93-2
Fe		1.02		7439-89-6

RN 851190-41-5 HCAPLUS

CN Copper iron lithium phosphate (Cu0.01Fe0.96Li(PO4)) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O4P		1		14265-44-2
Cu		0.01		7440-50-8
Li		1		7439-93-2
Fe		0.96		7439-89-6

RN 851190-42-6 HCAPLUS

CN Iron lithium zinc phosphate (Fe0.98Li1.04Zn0.01(PO4)) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O4P		1		14265-44-2
Zn		0.01		7440-66-6
Li		1.04		7439-93-2
Fe		0.98		7439-89-6

RN 851190-43-7 HCAPLUS

CN Indium iron lithium phosphate (In0.01Fe0.98Li1.01(PO4)) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O4P		1		14265-44-2
In		0.01		7440-74-6
Li		1.01		7439-93-2
Fe		0.98		7439-89-6

RN 851190-44-8 HCAPLUS

CN Iron lithium tin phosphate (Fe0.99Li0.97Sn0.01(PO4)) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O4P		1		14265-44-2
Sn		0.01		7440-31-5
Li		0.97		7439-93-2

Fe		0.99		7439-89-6
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RN 851190-45-9 HCAPLUS

CN Iron lithium tin phosphate (Fe1.01Li1.03Sn0.01(PO4)) (CA INDEX NAME)

Component		Ratio		Component
				Registry Number
O4P		1		14265-44-2
Sn		0.01		7440-31-5
Li		1.03		7439-93-2
Fe		1.01		7439-89-6

RN 851190-46-0 HCAPLUS

CN Iron lithium molybdenum phosphate (Fe1.01Li1.01Mo0.01(PO4)) (CA INDEX NAME)

Component		Ratio		Component
				Registry Number
O4P		1		14265-44-2
Mo		0.01		7439-98-7
Li		1.01		7439-93-2
Fe		1.01		7439-89-6

RN 851190-47-1 HCAPLUS

CN Iron lithium titanium phosphate (Fe0.97LiTi0.01(PO4)) (CA INDEX NAME)

Component		Ratio		Component
				Registry Number
O4P		1		14265-44-2
Ti		0.01		7440-32-6
Li		1		7439-93-2
Fe		0.97		7439-89-6

RN 851190-48-2 HCAPLUS

CN Iron lithium vanadium phosphate (Fe1.03Li1.02V0.01(PO4)) (CA INDEX NAME)

Component		Ratio		Component
				Registry Number
O4P		1		14265-44-2
V		0.01		7440-62-2
Li		1.02		7439-93-2
Fe		1.03		7439-89-6

RN 851190-49-3 HCAPLUS

CN Chromium iron lithium phosphate (Cr0.01Fe1.02Li1.03(PO4)) (CA INDEX NAME)

Component		Ratio		Component
				Registry Number
O4P		1		14265-44-2
Cr		0.01		7440-47-3
Li		1.03		7439-93-2
Fe		1.02		7439-89-6

RN 851190-50-6 HCAPLUS
 CN Chromium iron lithium phosphate (Cr0.01Fe0.97Li1.01(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Cr	0.01	7440-47-3
Li	1.01	7439-93-2
Fe	0.97	7439-89-6

RN 851190-51-7 HCAPLUS
 CN Copper iron lithium phosphate (Cu0.01Fe0.97Li(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Cu	0.01	7440-50-8
Li	1	7439-93-2
Fe	0.97	7439-89-6

RN 851190-53-9 HCAPLUS
 CN Iron lithium zinc phosphate (Fe1.01Li1.04Zn0.01(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Zn	0.01	7440-66-6
Li	1.04	7439-93-2
Fe	1.01	7439-89-6

RN 851190-54-0 HCAPLUS
 CN Indium iron lithium phosphate (In0.01Fe0.99Li1.02(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
In	0.01	7440-74-6
Li	1.02	7439-93-2
Fe	0.99	7439-89-6

RN 851190-55-1 HCAPLUS
 CN Iron lithium tin phosphate (Fe1.01Li1.05Sn0.01(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Sn	0.01	7440-31-5
Li	1.05	7439-93-2
Fe	1.01	7439-89-6

RN 851190-56-2 HCAPLUS
 CN Iron lithium tin phosphate (Fe1.01Li1.04Sn0.01(PO4)) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O4P	1	14265-44-2
Sn	0.01	7440-31-5
Li	1.04	7439-93-2
Fe	1.01	7439-89-6

RN 851190-57-3 HCAPLUS

CN Iron lithium molybdenum phosphate (Fe1.08Li1.03Mo0.01(PO4)) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O4P	1	14265-44-2
Mo	0.01	7439-98-7
Li	1.03	7439-93-2
Fe	1.08	7439-89-6

RN 851190-58-4 HCAPLUS

CN Iron lithium titanium phosphate (Fe1.04Li1.04Ti0.01(PO4)) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O4P	1	14265-44-2
Ti	0.01	7440-32-6
Li	1.04	7439-93-2
Fe	1.04	7439-89-6

IPCI H01M0004-48 [ICM,7]; H01M0004-58 [ICS,7]; H01M0004-02 [ICS,7]; C01B0025-45 [ICS,7]

IPCR C01B0025-45 [I,A]; H01M0004-131 [N,A]; H01M0004-1315 [N,A]; H01M0004-136 [N,A]; H01M0004-13915 [N,A]; H01M0004-58 [I,A]; H01M0010-052 [I,A]; H01M0010-36 [I,A]; H01M0010-44 [I,A]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Battery cathodes

(comps. and manufacture of cathode materials containing lithium iron composite phosphates for secondary lithium batteries)

IT Secondary batteries

(lithium; comps. and manufacture of cathode materials containing lithium iron composite phosphates for secondary lithium batteries)

IT 7447-39-4, Copper chloride (CuCl2), uses

7550-45-0, Titanium chloride (TiCl4), uses

7646-78-8, Tin chloride (SnCl4), uses

7646-85-7, Zinc chloride (ZnCl2), uses

7718-98-1, Vanadium chloride (VCl3)

7772-99-8, Tin chloride (SnCl2), uses

10025-73-7, Chromium chloride (CrCl3)

10241-05-1, Molybdenum chloride (MoCl5)

22519-64-8, Indium trichloride tetrahydrate

(comps. and manufacture of cathode materials containing lithium iron composite phosphates for secondary lithium batteries)

IT 851190-38-0P, Iron lithium vanadium phosphate

(Fe0.97Li1.01V0.01(PO4)) 851190-39-1P, Chromium iron

lithium phosphate (Cr0.01FeLi1.03(PO4)) 851190-40-4P,

Chromium iron lithium phosphate (Cr0.01FeLi0.99(PO4))

851190-41-5P, Copper iron lithium phosphate
(Cu_{0.01}Fe_{0.96}Li(P₀₄)) 851190-42-6P, Iron lithium zinc
phosphate (Fe_{0.98}Li_{0.04}Zn_{0.01}(P₀₄)) 851190-43-7P, Indium
iron lithium phosphate (In_{0.01}Fe_{0.98}Li_{0.01}(P₀₄))
851190-44-8P, Iron lithium tin phosphate
(Fe_{0.99}Li_{0.97}Sn_{0.01}(P₀₄)) 851190-45-9P, Iron lithium tin
phosphate (Fe_{0.01}Li_{0.03}Sn_{0.01}(P₀₄)) 851190-46-0P, Iron
lithium molybdenum phosphate (Fe_{0.01}Li_{0.01}Mo_{0.01}(P₀₄))
851190-47-1P, Iron lithium titanium phosphate
(Fe_{0.97}Li_{0.01}Ti_{0.01}(P₀₄)) 851190-48-2P, Iron lithium vanadium
phosphate (Fe_{0.03}Li_{0.02}V_{0.01}(P₀₄)) 851190-49-3P, Chromium
iron lithium phosphate (Cr_{0.01}Fe_{0.02}Li_{0.03}(P₀₄))
851190-50-6P, Chromium iron lithium phosphate
(Cr_{0.01}Fe_{0.97}Li_{0.01}(P₀₄)) 851190-51-7P, Copper iron
lithium phosphate (Cu_{0.01}Fe_{0.97}Li(P₀₄)) 851190-53-9P, Iron
lithium zinc phosphate (Fe_{0.01}Li_{0.04}Zn_{0.01}(P₀₄))
851190-54-0P, Indium iron lithium phosphate
(In_{0.01}Fe_{0.99}Li_{0.02}(P₀₄)) 851190-55-1P, Iron lithium tin
phosphate (Fe_{0.01}Li_{0.05}Sn_{0.01}(P₀₄)) 851190-56-2P, Iron
lithium tin phosphate (Fe_{0.01}Li_{0.04}Sn_{0.01}(P₀₄)) 851190-57-3P
, Iron lithium molybdenum phosphate (Fe_{0.08}Li_{0.03}Mo_{0.01}(P₀₄))
851190-58-4P, Iron lithium titanium phosphate
(Fe_{0.04}Li_{0.04}Ti_{0.01}(P₀₄))

(comps. and manufacture of cathode materials containing
lithium iron composite phosphates for secondary lithium batteries)
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS
RECORD (3 CITINGS)
REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN THE
RE FORMAT

L76 ANSWER 21 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2004:759266 HCAPLUS Full-text

DOCUMENT NUMBER: 141:280353

TITLE: Production of lithium compound phosphate
cathodes for secondary lithium ion
batteries

INVENTOR(S): Ishizuka, Masayuki; Ono, Koji; Toge, Yoshiyuki;
Saito, Mitsumasa

PATENT ASSIGNEE(S): Sumitomo Osaka Cement Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2004259471	A	20040916	JP 2003-45885	20030224
			<--	
JP 4252331	B2	20090408		
PRIORITY APPLN. INFO.:			JP 2003-45885	20030224
			<--	

ED Entered STN: 17 Sep 2004

AB The lithium compound phosphates, having olivine-type structure, are produced
by a process including steps of (1) spray thermal decomposition of solns. or
suspensions containing Li, metals excluding Li, and P, and (2) firing the
resultant decomposition products. The phosphates may be expressed by Li_xAyPO₄
(A = Cr, Mn, Fe, Co, Ni, Cu; 0 < x < 2; 0 < y ≤ 1). In the production, elec.

conductive substances and/or their precursors may be added to the soles./suspensions. The cathodes can be economically produced, and secondary lithium batteries employing the cathodes show high discharge capacity.

IT 757954-82-8P, Iron lithium phosphate ($\text{FeO-1LiO-2(PO}_4\text{)}$)
(cathodes; preparation of lithium (transition) metal phosphate cathodes for lithium ion batteries by spray thermal decomposition and firing)

RN 757954-82-8 HCAPLUS

CN Iron lithium phosphate ($\text{FeO-1LiO-2(PO}_4\text{)}$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O4P	1	14265-44-2
Li	0 - 2	7439-93-2
Fe	0 - 1	7439-89-6
IPCI H01M0004-58 [I,A]; H01M0004-62 [I,A]; C01B0025-45 [N,A]		
IPCR C01B0025-45 [I,A]; H01M0004-02 [I,A]; H01M0004-58 [I,A]; H01M0004-62 [I,A]; H01M0010-40 [I,A]		
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)		
ST battery cathode lithium transition metal phosphate		
IT Carbonaceous materials (technological products) (elec. conductive additives in cathodes; preparation of lithium (transition) metal phosphate cathodes for lithium ion batteries by spray thermal decomposition and firing)		
IT Carbon black, uses (elec. conductive additives in cathodes; preparation of lithium (transition) metal phosphate cathodes for lithium ion batteries by spray thermal decomposition and firing)		
IT Secondary batteries (lithium; preparation of lithium (transition) metal phosphate cathodes for lithium ion batteries by spray thermal decomposition and firing)		
IT Battery cathodes (preparation of lithium (transition) metal phosphate cathodes for lithium ion batteries by spray thermal decomposition and firing)		
IT Thermal decomposition (spray; preparation of lithium (transition) metal phosphate cathodes for lithium ion batteries by spray thermal decomposition and firing)		
IT 757954-84-0, Chromium lithium phosphate ($\text{CrO-1LiO-2(PO}_4\text{)}$) 757954-86-2, Lithium manganese phosphate ($\text{LiO-2MnO-1(PO}_4\text{)}$) 757954-88-4, Lithium nickel phosphate ($\text{LiO-2NiO-1(PO}_4\text{)}$) 757954-90-8, Copper lithium phosphate ($\text{CuO-1LiO-2(PO}_4\text{)}$) (cathodes; preparation of lithium (transition) metal phosphate cathodes for lithium ion batteries by spray thermal decomposition and firing)		
IT 757954-80-6P, Cobalt lithium phosphate ($\text{CoO-1LiO-2(PO}_4\text{)}$) 757954-82-8P, Iron lithium phosphate ($\text{FeO-1LiO-2(PO}_4\text{)}$) (cathodes; preparation of lithium (transition) metal phosphate cathodes for lithium ion batteries by spray thermal decomposition and firing)		
IT 1310-65-2, Lithium hydroxide 7447-41-8, Lithium chloride, processes 7664-38-2, Phosphoric acid, processes 7758-94-3, Iron chloride (fec12) 7790-69-4, Lithium nitrate 10141-05-6 (in preparation of lithium (transition) metal phosphate cathodes for lithium ion batteries by spray thermal decomposition and firing)		
IT 57-50-1, Sucrose, processes		

(precursors for elec. conductive additives in cathodes;
 preparation of lithium (transition) metal phosphate cathodes
 for lithium ion batteries by spray thermal decomposition and firing)
 OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS
 RECORD (1 CITINGS)

L76 ANSWER 22 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
 ACCESSION NUMBER: 2004:759265 HCAPLUS Full-text
 DOCUMENT NUMBER: 141:280352
 TITLE: Lithium transition metal phosphate
 cathodes for lithium ion batteries
 INVENTOR(S): Ishizuka, Masayuki; Ono, Koji; Yamada, Satoshi;
 Toge, Yoshiyuki; Saito, Mitsumasa
 PATENT ASSIGNEE(S): Sumitomo Osaka Cement Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004259470	A	20040916	JP 2003-45884	20030224
JP 4190912	B2	20081203	<--	
PRIORITY APPLN. INFO.:			JP 2003-45884	20030224
			<--	

ED Entered STN: 17 Sep 2004

AB The cathodes are expressed by olivine-type Li_xAyPO_4 ($A = \text{Cr, Mn, Fe, Co, Ni, Cu}$; $0 < x < 2$; $0 < y \leq 1$) with crystallite diameter of ≤ 35 nm. The cathodes can be economically produced, and secondary lithium batteries employing the cathodes show high discharge capacity.

IT 757954-82-8P, Iron lithium phosphate ($\text{FeO-1LiO-2(PO}_4\text{)}$)
 (cathodes; lithium transition metal phosphate
 cathodes for lithium ion batteries)

RN 757954-82-8 HCAPLUS

CN Iron lithium phosphate ($\text{FeO-1LiO-2(PO}_4\text{)}$) (9CI) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O4P	1	14265-44-2
Li	0 - 2	7439-93-2
Fe	0 - 1	7439-89-6

IPCI H01M0004-58 [I,A]; C01B0025-45 [I,A]

IPCR C01B0025-45 [I,A]; H01M0004-02 [I,A]; H01M0004-58 [I,A]; H01M0010-40 [I,A]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST battery cathode lithium transition metal phosphate

IT Battery cathodes

(lithium transition metal phosphate cathodes for lithium ion batteries)

IT Secondary batteries

(lithium; lithium transition metal phosphate cathodes for lithium ion batteries)

IT 757954-84-0, Chromium lithium phosphate ($\text{CrO-1LiO-2(PO}_4\text{)}$)

757954-86-2, Lithium manganese phosphate ($\text{LiO-2MnO-1(PO}_4\text{)}$)

176 ANSWER 23 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
ACCESSION NUMBER: 2004:472088 HCAPLUS Full-text
DOCUMENT NUMBER: 141:26116
TITLE: Boron-doped lithium phosphate-type insertion
compounds as electrodes for batteries and
electrochromic devices
INVENTOR(S): Franger, Sylvain; Le Cras, Frederic; Bourbon,
Carole
PATENT ASSIGNEE(S): Commissariat A L'energie Atomique, Fr.
SOURCE: Fr. Demande, 36 pp.
CODEN: FRXXBL
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
FR 2848205	A1	20040611	FR 2002-15343	20021205
			<--	
FR 2848205	B1	20060324		
WO 2004052787	A1	20040624	WO 2003-FR50148	20031202
			<--	
W: CN, JP, US				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,				
IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR				
EP 1567452	A1	20050831	EP 2003-799704	20031202
			<--	
EP 1567452	B1	20060510		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,				
PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
CN 1720197	A	20060111	CN 2003-80104737	20031202
			<--	
CN 100371254	C	20080227		
AT 325778	T	20060615	AT 2003-799704	20031202
			<--	
ES 2264036	T3	20061216	ES 2003-799704	20031202
			<--	
JP 2007502249	T	20070208	JP 2006-527177	20031202
			<--	
US 20060127295	A1	20060615	US 2005-536178	20051027
			<--	
US 7529014	B2	20090505		
PRIORITY APPLN. INFO.:			FR 2002-15343	A 20021205
			<--	
			WO 2003-FR50148	W 20031202
			<--	

AB Boron-doped lithium insertion compds. suitable for use as battery electrodes have the general formula $\text{Li}_m\text{M}_1\text{M}_2\text{M}_3\text{M}_4\text{M}_5\text{Z}_n\text{B}_x$. (XO_4-EZE), in which: (1) M

is a divalent metal ion, such as V^{2+} , Mn^{2+} , Fe^{2+} , Co^{2+} , and Ni^{2+} , (2) M1 is a monovalent metal ion, such as Na^+ and K^+ , (3) M2 is a divalent metal ion, such as Mg^{2+} , Zn^{2+} , Cu^{2+} , Ti^{2+} , and Ca^{2+} , (4) M3 is a trivalent metal ion selected from Al^{3+} , Ti^{3+} , Cr^{3+} , Fe^{3+} , Mn^{3+} , Ga^{3+} , and V^{3+} , (5) M4 is a tetravalent metal ion selected from Ti^{4+} , Ge^{4+} , Sn^{4+} , V^{4+} , and Zr^{4+} , (6) M5 is a pentavalent metal ion selected from V^{5+} , Nb^{5+} , and Ta^{5+} , (7) X is an oxygen-coordinated metal (oxidation state 2-6) selected from Al^{3+} , V^{5+} , Si^{4+} , P^{5+} , S^{6+} , and Ge^{4+} , and (8) Z is a halogen. The coeffs. are all pos. and listed as follows: (1) $\alpha = 0-2$, (2) $\beta = 1-2$, (3) $\gamma = 0-3$, (4) $\varepsilon = 0-2$, (5) $\alpha + 2\beta + 3\gamma + v + 2w + 4y + 5z + m = 8 - \varepsilon$, and (6) $\gamma/S = 0-0.1$ ($S = \beta + v + w + x + y + z$). Preferred substances are $LiFe_{0.95}B_{0.033}PO_4$ and $Li_3Fe_{1.93}B_{0.07}(PO_4)_3$, and compds. that are isotypes with Nasicon ($NaxM_2X_3O_{12}$, in which $X = P, Mo, Si, Ge$, and S ; $x = 0-5$, preferably 3) and olivine.

- IT 411234-54-3, Iron lithium phosphate
(boron-doped, electrode; boron-doped lithium phosphate-type
insertion compds. as electrodes for batteries and electrochromic
devices)
RN 411234-54-3 HCAPLUS
CN Phosphoric acid, iron lithium salt (9CI) (CA INDEX NAME)



●x Fe(x)

●x Li

- IT 700375-31-1, Iron lithium boride phosphate
($Fe_{0.95}LiB_{0.03}(PO_4)$) 700375-32-2, Iron lithium boride
phosphate ($Fe_{1.93}LiB_{0.07}(PO_4)_3$)
(electrode; boron-doped lithium phosphate-type insertion compds. as
electrodes for batteries and electrochromic devices)
RN 700375-31-1 HCAPLUS
CN Iron lithium boride phosphate ($Fe_{0.95}LiB_{0.03}(PO_4)$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
B	0.03	7440-42-8
Li	1	7439-93-2
Fe	0.95	7439-89-6

- RN 700375-32-2 HCAPLUS
CN Iron lithium boride phosphate ($Fe_{1.93}LiB_{0.07}(PO_4)_3$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
B	0.07	7440-42-8

Li		1		7439-93-2
Fe		1.93		7439-89-6

IPCI C01B0025-00 [I,C]; C01D0015-00 [I,C]; H01M0004-48 [I,C]; H01M0004-50 [I,C]; H01M0004-52 [I,C]; H01M0010-34 [I,C]; C01D0015-00 [I,A]; C01B0025-26 [I,A]; C01B0025-30 [I,A]; H01M0004-48 [I,A]; H01M0004-50 [I,A]; H01M0004-52 [I,A]; H01M0010-34 [I,A]

IPCR C01B0025-26 [I,A]; H01M0004-131 [I,A]; H01M0004-1315 [I,A]; H01M0004-1391 [I,A]; H01M0004-13915 [I,A]; H01M0004-36 [N,A]; H01M0004-48 [I,A]; H01M0004-485 [I,A]; H01M0004-58 [I,A]; H01M0010-0525 [N,A]; H01M0010-36 [N,A]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Battery cathodes
Battery electrodes
(active materials for; boron-doped lithium phosphate-type insertion compds. as electrodes for batteries and electrochromic devices)

IT 13826-59-0, Lithium manganese phosphate 411234-54-3, Iron lithium phosphate
(boron-doped, electrode; boron-doped lithium phosphate-type insertion compds. as electrodes for batteries and electrochromic devices)

IT 700375-31-1, Iron lithium boride phosphate
(Fe_{0.95}LiB_{0.03}(PO₄)) 700375-32-2, Iron lithium boride phosphate (Fe_{1.93}LiB_{0.07}(PO₄)) 700375-33-3, Lithium manganese boride phosphate (LiMn_{0.95}B_{0.03}(PO₄))
(electrode; boron-doped lithium phosphate-type insertion compds. as electrodes for batteries and electrochromic devices)

OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L76 ANSWER 24 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2004:164679 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 140:342048

TITLE: Nano-network electronic conduction in iron and nickel olivine phosphates

AUTHOR(S): Herle, P. Subramanya; Ellis, B.; Coombs, N.; Nazar, L. F.

CORPORATE SOURCE: Department of Chemistry, University of Waterloo, Waterloo, ON, N2L 3G1, Can.

SOURCE: Nature Materials (2004), 3(3), 147-152

CODEN: MMAACR; ISSN: 1476-1122

PUBLISHER: Nature Publishing Group

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 01 Mar 2004

AB Efficient electron and ion transport is a critical issue in the new group of materials based on Li metal phosphates that are important as cathodes for Li-ion batteries. There is interest in olivine-type LiFePO₄, but although the 1-dimensional Li-ion mobility in this framework is high, the electronically-insulating phosphate groups that benefit the voltage also isolate the redox centers within the lattice. The pristine compound is a very poor conductor (σ .apprx. 10⁻⁹ S/cm), thus limiting its electrochem. response. Inclusion of conductive phases however increases its capacity to near-theor. values. It was also attempted to alter the inherent conductivity of the lattice by doping it with a super-valent ion. Compns. were reported to be black p-type semiconductors with conductivities of .apprx.10⁻² S/cm arising from minority

Fe3+ hole carriers. The results for doped (and undoped) LiMPO4 (M = Fe, Ni) show that a percolating nano-network of metal-rich phosphides are responsible for the enhanced conductivity. The demonstration of non-carbonaceous-network grain-boundary conduction is a 1st for these materials and it holds promise for other insulating phosphates.

IT 681153-59-3P, Iron lithium phosphate (FeLi0.94(PO4))
 681153-62-8P, Iron lithium phosphate (FeLi0.97(PO4))
 681153-63-9P, Iron lithium phosphate (FeLi0.91(PO4))
 (nano-network electronic conduction in iron and nickel olivine phosphate cathode material for lithium batteries)

RN 681153-59-3 HCAPLUS

CN Iron lithium phosphate (FeLi0.94(PO4)) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O4P	1	14265-44-2
Li	0.94	7439-93-2
Fe	1	7439-89-6

RN 681153-62-8 HCAPLUS

CN Iron lithium phosphate (FeLi0.97(PO4)) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O4P	1	14265-44-2
Li	0.97	7439-93-2
Fe	1	7439-89-6

RN 681153-63-9 HCAPLUS

CN Iron lithium phosphate (FeLi0.91(PO4)) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O4P	1	14265-44-2
Li	0.91	7439-93-2
Fe	1	7439-89-6

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 76

ST iron nickel olivine phosphate cathode electronic conduction lithium battery

IT Secondary batteries

(lithium; nano-network electronic conduction in iron and nickel olivine phosphate cathode material for lithium batteries)

IT Battery cathodes

Electric conductivity

(nano-network electronic conduction in iron and nickel olivine phosphate cathode material for lithium batteries)

IT 15365-14-7P, Iron lithium phosphate (FeLiPO4) 681153-59-3P
 , Iron lithium phosphate (FeLi0.94(PO4)) 681153-60-6P, Iron lithium
 zirconium phosphate (FeLi0.9Zr0.01(PO4)) 681153-61-7P, Iron lithium
 zirconium phosphate (FeLi0.93Zr0.01(PO4)) 681153-62-8P,
 Iron lithium phosphate (FeLi0.97(PO4)) 681153-63-9P, Iron

lithium phosphate (FeLi_{0.91}(PO₄)) 681153-64-OP, Lithium nickel phosphate (Li_{0.9}Ni(PO₄)) 681153-65-1P, Lithium nickel phosphate (Li_{0.94}Ni(PO₄))

(nano-network electronic conduction in iron and nickel olivine phosphate cathode material for lithium batteries)

OS.CITING REF COUNT: 277 THERE ARE 277 CAPLUS RECORDS THAT CITE THIS RECORD (281 CITINGS)

REFERENCE COUNT: 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L76 ANSWER 25 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2003:532921 HCAPLUS Full-text

DOCUMENT NUMBER: 139:87848

TITLE: Transition metal polyanion oxides as lithium ion intercalating structures for battery electrode

INVENTOR(S): Chiang, Yet-Ming; Chung, Sung-Yoon; Bloking, Jason T.; Andersson, Anna M.

PATENT ASSIGNEE(S): Massachusetts Institute of Technology, USA

SOURCE: PCT Int. Appl., 122 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003056646	A1	20030710	WO 2002-US41471	20021223
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W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CA 2471455	A1	20030710	CA 2002-2471455	20021223
<--				
AU 2002364020	A1	20030715	AU 2002-364020	20021223
<--				
US 20040005265	A1	20040108	US 2002-329046	20021223
<--				
US 7338734	B2	20080304		
EP 1456895	A1	20040915	EP 2002-798597	20021223
<--				
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK				
CN 1615554	A	20050511	CN 2002-827276	20021223
<--				
CN 100414746	C	20080827		
JP 2005514304	T	20050519	JP 2003-557056	20021223
<--				
KR 2010031782	A	20100324	KR 2010-7004725	20021223
<--				

EP 2278643	A1	20110126	EP 2010-185031	20021223
			<--	
			R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE,	
			IT, LI, LU, MC, NL, PT, SE, SI, SK, TR	
IN 2004KN00891	A	20060519	IN 2004-KN891	20040625
			<--	
IN 239780	A1	20100402		
AU 2007202605	A1	20070628	AU 2007-202605	20070607
			<--	
AU 2007202605	B2	20110421		
US 20090311597	A1	20091217	US 2007-901463	20070917
			<--	
IN 2008KN04155	A	20090306	IN 2008-KN4155	20081014
			<--	
IN 2008KN04486	A	20090313	IN 2008-KN4486	20081106
			<--	
PRIORITY APPLN. INFO.:			US 2001-343060P	P 20011221
			<--	
			US 2002-388721P	P 20020614
			<--	
			US 2002-412656P	P 20020920
			<--	
			AU 2002-364020	A3 20021223
			<--	
			EP 2002-798597	A3 20021223
			<--	
			KR 2004-7009809	A3 20021223
			<--	
			US 2002-329046	A1 20021223
			<--	
			WO 2002-US41471	W 20021223
			<--	
			IN 2004-KN891	A3 20040625
			<--	

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STN: 11 Jul 2003

AB The invention concerns a compound comprising a composition A.(M'l-aM'a)y(XD4)z, Ax, (M'l-aM'a)y(DXD4)z, or Ax, (M'l-aM'a)y(X2D7)z, and have values such that x, plus y(1-a) times a formal valence or valences of M', plus ya times a formal valence or valence of M', is equal to z times a formal valence of the XD4, X2D7, or DXD4 group; or a compound comprising a composition (Al-aM'a)xM'y(XD4)z, (Al-aM'a)xM'y(DXD4)z, (Al-aM'a)xM'y(X2D7)z and have values such that (1-a)x plus the quantity ax times the formal valence or valences of M' plus y times the formal valence or valences of M' is equal to z times the formal valence of the XD4, X2D7 or DXD4 group. In the compound, A is at least one of an alkali metal and hydrogen, M' is a first-row transition metal, X is at least one of phosphorus, sulfur, arsenic, molybdenum, and tungsten, M' any of a Group IIA, IIIA, IVA, VA, VIA, VIIA, VIIIA, IB, IIB, IVB, VB, and VIB metal, D is at least one of oxygen, nitrogen, carbon, or a halogen, 0.0001 < a ≤ 0.1, and x, y, and z are greater than zero. The compound can have a conductivity at 27° of at least about 10-8 S/cm. The compound can be a doped lithium phosphate that can intercalate lithium or hydrogen. The compound can be used in an electrochem. device including electrodes and storage batteries and can have a gravimetric capacity of at least about 80 mA-h/g while being charged/discharged at greater than about C rate of the compound

IT 411234-54-3P 478819-82-8P, Iron lithium titanium phosphate FeLi0.99Ti0.01(PO4) 478819-83-9P, Iron lithium niobium phosphate FeLi0.99Nb0.01(PO4) 478819-84-0P, Iron lithium magnesium phosphate FeLi0.99Mg0.01(PO4) 478819-85-1P, Aluminum iron lithium phosphate (Al0.01FeLi0.99(PO4))

478819-87-3P, Iron lithium titanium phosphate
 Fe_{0.99}LiTi_{0.01}(PO₄) 478819-89-5P, Iron lithium zirconium
 phosphate (Fe_{0.99}LiZr_{0.01}(PO₄)) 496816-58-1P, Iron lithium
 zirconium phosphate (Fe_{0.98}LiZr_{0.02}(PO₄)) 531493-25-1P,
 Iron lithium titanium phosphate Fe_{0.98}LiTi_{0.02}(PO₄)
 554453-44-0P, Iron lithium zirconium phosphate
 (Fe_{0.95}LiZr_{0.05}(PO₄)) 554453-45-1P, Iron lithium niobium
 phosphate (FeLi_{0.98}Nb_{0.02}(PO₄)) 554453-46-2P, Iron lithium
 niobium phosphate (FeLi_{0.96}Nb_{0.04}(PO₄)) 554453-47-3P, Iron
 lithium phosphate (FeLi_{0.99}(PO₄)) 554453-48-4P, Iron
 lithium phosphate (Fe_{0.99}Li_{0.01}(PO₄))
 (transition metal polyanion oxides as lithium ion intercalating
 structures for battery electrode)

RN 411234-54-3 HCAPLUS

CN Phosphoric acid, iron lithium salt (9CI) (CA INDEX NAME)



●x Fe(x)

●x Li

RN 478819-82-8 HCAPLUS

CN Iron lithium titanium phosphate (FeLi_{0.99}Ti_{0.01}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Ti	0.01	7440-32-6
Li	0.99	7439-93-2
Fe	1	7439-89-6

RN 478819-83-9 HCAPLUS

CN Iron lithium niobium phosphate (FeLi_{0.99}Nb_{0.01}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Nb	0.01	7440-03-1
Li	0.99	7439-93-2
Fe	1	7439-89-6

RN 478819-84-0 HCAPLUS

CN Iron lithium magnesium phosphate (FeLi_{0.99}Mg_{0.01}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
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Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	0.01	7439-95-4
Li	0.99	7439-93-2
Fe	1	7439-89-6

RN 478819-85-1 HCAPLUS

CN Aluminum iron lithium phosphate (Al₁₀0.01FeLi_{0.99}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	0.99	7439-93-2
Fe	1	7439-89-6
Al	0.01	7429-90-5

RN 478819-87-3 HCAPLUS

CN Iron lithium titanium phosphate (Fe_{0.99}LiTi_{0.01}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Ti	0.01	7440-32-6
Li	1	7439-93-2
Fe	0.99	7439-89-6

RN 478819-89-5 HCAPLUS

CN Iron lithium zirconium phosphate (Fe_{0.99}LiZr_{0.01}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Zr	0.01	7440-67-7
Li	1	7439-93-2
Fe	0.99	7439-89-6

RN 496816-58-1 HCAPLUS

CN Iron lithium zirconium phosphate (Fe_{0.98}LiZr_{0.02}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Zr	0.02	7440-67-7
Li	1	7439-93-2
Fe	0.98	7439-89-6

RN 531493-25-1 HCAPLUS

CN Iron lithium titanium phosphate (Fe_{0.98}LiTi_{0.02}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Ti	0.02	7440-32-6

Li		1		7439-93-2
Fe		0.98		7439-89-6

RN 554453-44-0 HCAPLUS

CN Iron lithium zirconium phosphate (Fe0.95LiZr0.05(PO4)) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O4P		1		14265-44-2
Zr		0.05		7440-67-7
Li		1		7439-93-2
Fe		0.95		7439-89-6

RN 554453-45-1 HCAPLUS

CN Iron lithium niobium phosphate (FeLi0.98Nb0.02(PO4)) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O4P		1		14265-44-2
Nb		0.02		7440-03-1
Li		0.98		7439-93-2
Fe		1		7439-89-6

RN 554453-46-2 HCAPLUS

CN Iron lithium niobium phosphate (FeLi0.96Nb0.04(PO4)) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O4P		1		14265-44-2
Nb		0.04		7440-03-1
Li		0.96		7439-93-2
Fe		1		7439-89-6

RN 554453-47-3 HCAPLUS

CN Iron lithium phosphate (Fe1.01Li0.99(PO4)) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O4P		1		14265-44-2
Li		0.99		7439-93-2
Fe		1.01		7439-89-6

RN 554453-48-4 HCAPLUS

CN Iron lithium phosphate (Fe0.99Li1.01(PO4)) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O4P		1		14265-44-2
Li		1.01		7439-93-2
Fe		0.99		7439-89-6

IPCI H01M0004-58 [ICM,7]

IPCR B01D0071-02 [I,A]; B01J0020-02 [I,A]; C01B0003-00 [I,A]; C01B0025-45 [I,A]; H01M0004-58 [I,A]; H01M0004-70 [N,A]; H01M0004-74 [N,A];

H01M0004-86 [I,A]; H01M0006-16 [I,A]
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 49, 72
 IT 15365-14-7P, Iron lithium phosphate felipo4 223505-09-7P, Iron lithium titanium phosphate 411234-54-3P
 478819-82-8P, Iron lithium titanium phosphate
 FeLi_{0.99}Ti_{0.01}(PO₄) 478819-83-9P, Iron lithium niobium phosphate FeLi_{0.99}Nb_{0.01}(PO₄) 478819-84-0P, Iron lithium magnesium phosphate FeLi_{0.99}Mg_{0.01}(PO₄) 478819-85-1P, Aluminum iron lithium phosphate (Al_{0.01}FeLi_{0.99}(PO₄)) 478819-87-3P, Iron lithium titanium phosphate Fe_{0.99}LiTi_{0.01}(PO₄) 478819-89-5P, Iron lithium zirconium phosphate (Fe_{0.99}LiZr_{0.01}(PO₄)) 496816-58-1P, Iron lithium zirconium phosphate (Fe_{0.98}LiZr_{0.02}(PO₄)) 531493-25-1P, Iron lithium titanium phosphate Fe_{0.98}LiTi_{0.02}(PO₄) 554453-36-0P 554453-37-1P 554453-38-2P 554453-39-3P 554453-40-6P 554453-41-7P 554453-42-8P 554453-44-0P, Iron lithium zirconium phosphate (Fe_{0.95}LiZr_{0.05}(PO₄)) 554453-45-1P, Iron lithium niobium phosphate (FeLi_{0.98}Nb_{0.02}(PO₄)) 554453-46-2P, Iron lithium niobium phosphate (FeLi_{0.96}Nb_{0.04}(PO₄)) 554453-47-3P, Iron lithium phosphate (Fe_{0.01}Li_{0.99}(PO₄)) 554453-48-4P, Iron lithium phosphate (Fe_{0.99}Li_{0.01}(PO₄))
 (transition metal polyanion oxides as lithium ion intercalating structures for battery electrode)
 OS.CITING REF COUNT: 12 THERE ARE 12 CAPLUS RECORDS THAT CITE THIS RECORD (15 CITINGS)
 REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT
 L76 ANSWER 26 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
 ACCESSION NUMBER: 2003:437518 HCAPLUS Full-text
 DOCUMENT NUMBER: 139:278965
 TITLE: Experimental and computational study of the structure and electrochemical properties of monoclinic Li_xM₂(PO₄)₃ compounds
 AUTHOR(S): Morgan, D.; Ceder, G.; Saidi, M. Y.; Barker, J.; Swoyer, J.; Huang, H.; Adamson, G.
 CORPORATE SOURCE: Computational Modeling Consultants, Wellesley, MA, USA
 SOURCE: Journal of Power Sources (2003), 119-121, 755-759
 CODEN: JPSODZ; ISSN: 0378-7753
 PUBLISHER: Elsevier Science B.V.
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 ED Entered STN: 09 Jun 2003
 AB This paper presents a combined computational and exptl. study of the structural and electrochem. properties of monoclinic Li_xM₂(PO₄)₃ (with a focus on M=V). The voltage curve for x=0-3 Li is measured exptl. and calculated. Features of the voltage curve are understood as emerging from site energetics, Li ordering, and redox couples. These features are found to be largely independent of alloying and a simple additive model is proposed to analyze the voltage curve for different cation substitutions. The model is shown to be very useful for understanding exptl. results for a number of substituted compds.
 IT 605661-91-4, Iron lithium phosphate (Fe₂Li_{0.25}(PO₄)₃)
 (exptl. and computational study of crystal structure site occupancy

and electrochem. properties of monoclinic $\text{Li}_x\text{M}_2(\text{PO}_4)_3$ compds. as battery cathodes)

RN 605661-91-4 HCAPLUS

CN Iron lithium phosphate ($\text{Fe}_2\text{Li}_{0.25}(\text{PO}_4)_3$) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
=====	=====	=====
O4P	3	14265-44-2
Li	0.25	7439-93-2
Fe	2	7439-89-6

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 72

IT Ab initio methods

Battery cathodes

Insertion reaction

Intercalation

Open circuit potential

(exptl. and computational study of crystal structure site occupancy and electrochem. properties of monoclinic $\text{Li}_x\text{M}_2(\text{PO}_4)_3$ compds. as battery cathodes)

IT Secondary batteries

(lithium; exptl. and computational study of crystal structure site occupancy and electrochem. properties of monoclinic $\text{Li}_x\text{M}_2(\text{PO}_4)_3$ compds. as battery cathodes)

IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate

21324-40-3, Lithium hexafluorophosphate

(electrolyte; exptl. and computational study of crystal structure site occupancy and electrochem. properties of monoclinic $\text{Li}_x\text{M}_2(\text{PO}_4)_3$ compds. as battery cathodes)

IT 204653-31-6, Lithium titanium vanadium phosphate $\text{Li}_3\text{TiV}(\text{PO}_4)_3$

204653-32-7, Aluminum lithium vanadium phosphate $\text{AlLi}_3\text{V}(\text{PO}_4)_3$

605661-90-3, Lithium vanadium phosphate ($\text{Li}_{0.25}\text{V}_2(\text{PO}_4)_3$)

605661-91-4, Iron lithium phosphate ($\text{Fe}_2\text{Li}_{0.25}(\text{PO}_4)_3$)

605661-92-5 605661-93-6

(exptl. and computational study of crystal structure site occupancy and electrochem. properties of monoclinic $\text{Li}_x\text{M}_2(\text{PO}_4)_3$ compds. as battery cathodes)

IT 84159-18-2P, Lithium vanadium phosphate $\text{Li}_3\text{V}_2(\text{PO}_4)_3$

(exptl. and computational study of crystal structure site occupancy and electrochem. properties of monoclinic $\text{Li}_x\text{M}_2(\text{PO}_4)_3$ compds. as battery cathodes)

OS.CITING REF COUNT: 15 THERE ARE 15 CAPLUS RECORDS THAT CITE THIS RECORD (15 CITINGS)

REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L76 ANSWER 27 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2002:927780 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 138:26878

TITLE: Anode and cathode materials for sodium ion batteries

INVENTOR(S): Barker, Jeremy; Yazid, Saidi M.; Swoyer, Jeffrey L.

PATENT ASSIGNEE(S): Valence Technology, Inc., USA

SOURCE: PCT Int. Appl., 77 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 5
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002097907	A2	20021205	WO 2002-US10775	20020404
<--				
WO 2002097907	A3	20040415		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CA 2442257	A1	20021205	CA 2002-2442257	20020404
<--				
AU 2002320020	A1	20021209	AU 2002-320020	20020404
<--				
EP 1430555	A2	20040623	EP 2002-749518	20020404
<--				
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
JP 2004533706	T	20041104	JP 2003-500990	20020404
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JP 4643903	B2	20110302		
CN 1723578	A	20060118	CN 2002-811313	20020404
<--				
CN 100372158	C	20080227		
KR 814540	B1	20080317	KR 2003-7013080	20031006
<--				
JP 2009266821	A	20091112	JP 2009-125190	20090525
<--				
PRIORITY APPLN. INFO.:			US 2001-283560P	P 20010406
<--				
			JP 2003-500990	A3 20020404
<--				
			WO 2002-US10775	W 20020404
<--				
ED	Entered STN: 06 Dec 2002			
AB	Sodium ion batteries are based on sodium based active materials selected among compds. of the general formula: AaMb(XY4)cZ-d, wherein a comprises sodium, M comprises one or more metals, comprising at least one metal which is capable of undergoing oxidation to a higher valence state, Z is OH or halogen, and XY4 represents phosphate or a similar group. The anode of the battery includes a carbon material that is capable of inserting sodium ions. The carbon anode cycles reversibly at a specific capacity greater than 100 mAh/g.			
IT	477779-82-1, Iron lithium sodium fluoride phosphate (Fe(Li,Na)F(PO4)) (anode and cathode materials for sodium ion batteries)			
RN	477779-82-1 HCAPLUS			
CN	Iron lithium sodium fluoride phosphate (Fe(Li,Na)F(PO4)) (CA INDEX NAME)			

Component	Ratio	Component Registry Number
=====	=====	=====
F	1	14762-94-8
O4P	1	14265-44-2
Na	0 - 1	7440-23-5
Li	0 - 1	7439-93-2
Fe	1	7439-89-6
IPCI	H01M0004-58 [ICM,7]; H01M0010-40 [ICS,7]	
IPCR	C01B0025-455 [I,A]; H01M0004-02 [N,A]; H01M0004-40 [I,A]; H01M0004-58 [I,A]; H01M0004-583 [N,A]; H01M0006-16 [N,A]; H01M0010-054 [I,A]; H01M0010-0564 [I,A]; H01M0010-0565 [I,A]; H01M0010-36 [I,A]	
CC	52-2 (Electrochemical, Radiational, and Thermal Energy Technology)	
IT	Battery anodes	
	Battery cathodes (anode and cathode materials for sodium ion batteries)	
IT	Transition metal compounds (phosphates, sodium-containing; anode and cathode materials for sodium ion batteries)	
IT	Secondary batteries (sodium; anode and cathode materials for sodium ion batteries)	
IT	7440-44-0, Carbon, uses 7664-38-2D, Phosphoric acid, transition metal compds., Na-containing 12028-91-0, Copper sodium phosphate 15670-69-6 16986-74-6, Iron Sodium phosphate Fe2Na3(PO4)3 69104-83-2, Sodium titanium phosphate Na3Ti2(PO4)3 69104-84-3 95983-75-8, Sodium titanium phosphate 477779-61-6, Sodium vanadium phosphate 477779-62-7, Manganese sodium phosphate 477779-64-9, Cobalt sodium phosphate 477779-65-0, Nickel sodium phosphate 477779-67-2, Cobalt sodium fluoride phosphate (CoNa0.8-1.5F0.8-1.5(PO4)) 477779-68-3, Iron sodium fluoride phosphate (FeNa0.8-1.5F0.8-1.5(PO4)) 477779-69-4, Sodium vanadium fluoride phosphate (Na0.8-1.5VF0.8-1.5(PO4)) 477779-70-7, Manganese sodium fluoride phosphate (MnNa0.8-1.5F0.8-1.5(PO4)) 477779-71-8, Copper sodium fluoride phosphate (CuNa0.8-1.5F0.8-1.5(PO4)) 477779-72-9, Nickel sodium fluoride phosphate (NiNa0.8-1.5F0.8-1.5(PO4)) 477779-73-0, Sodium titanium fluoride phosphate (Na0.8-1.5TiF0.8-1.5(PO4)) 477779-74-1 477779-76-3 477779-78-5 477779-79-6 477779-80-9, Iron magnesium sodium phosphate ((Fe,Mg)Na(PO4)) 477779-81-0 477779-82-1, Iron lithium sodium fluoride phosphate (Fe(Li,Na)F(PO4)) 477779-83-2, Cobalt lithium sodium fluoride phosphate (Co(Li,Na)F(PO4)) 477779-84-3, Copper lithium sodium fluoride phosphate (Cu(Li,Na)F(PO4)) 477779-85-4, Lithium nickel sodium fluoride phosphate ((Li,Na)NiF(PO4)) 477779-86-5 (anode and cathode materials for sodium ion batteries)	
IT	7440-23-5, Sodium, uses (anode and cathode materials for sodium ion batteries)	
IT	53602-70-3P, Iron sodium phosphate FeNaPO4 83201-61-0P, Sodium vanadyl phosphate NaVOPO4 477779-87-6P, Sodium vanadium fluoride phosphate (NaVF(PO4)) 477779-88-7P 477779-89-8P 477779-90-1P, Iron sodium fluoride phosphate (FeNa2F(PO4)) (anode and cathode materials for sodium ion batteries)	

IT 1314-62-1P, Vanadia, preparation 12359-27-2P, Vanadyl phosphate
(anode and cathode materials for sodium ion
batteries)

OS.CITING REF COUNT: 10 THERE ARE 10 CAPLUS RECORDS THAT CITE THIS
RECORD (29 CITINGS)

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN THE
RE FORMAT

L76 ANSWER 28 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
ACCESSION NUMBER: 2002:849980 HCAPLUS Full-text
DOCUMENT NUMBER: 137:340029
TITLE: Method of forming phosphate powder particle
compositions with complex anions for electrodes
and batteries

INVENTOR(S): Chaloner-Gill, Benjamin; Pinoli, Allison A.;
Horne, Craig R.; Mosso, Ronald J.; Bi, Xiangxin

PATENT ASSIGNEE(S): Neo Photonics Corporation, USA

SOURCE: PCT Int. Appl., 59 pp.
CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 32

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002089233	A2	20021107	WO 2002-US12069	20020418
<--				
WO 2002089233	A3	20021219		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
US 20020192137	A1	20021219	US 2001-845985	20010430
<--				
AU 2002338575	A1	20021111	AU 2002-338575	20020418
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PRIORITY APPLN. INFO.:			US 2001-845985	A 20010430
<--				
			WO 2002-US12069	W 20020418
<--				

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STN: 08 Nov 2002

AB Nanoscale and submicron particles have been produced with polyat. anions. The
particles can be crystalline or amorphous. The particles are synthesized in a
flowing reactor, preferably with an intense light beam driving the reaction.
In preferred embodiments, the particles are highly uniform. Batteries can be
formed from submicron and nanoscale lithium metal phosphates. Coatings also
can be formed from the particles.

IT 474317-40-3P, Iron lithium phosphate (FeLi0.1-1(P04))
474317-41-4P, Iron lithium manganese phosphate
(Fe0.2-1LiMn0-0.8(P04)) 474317-42-5P, Iron lithium
manganese phosphate (Fe0.2-0.6LiMn0.4-0.8(P04))

(method of forming phosphate powder particle compns. with complex anions for electrodes and batteries)

RN 474317-40-3 HCAPLUS

CN Iron lithium phosphate (FeLi0.1-1(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	0.1 - 1	7439-93-2
Fe	1	7439-89-6

RN 474317-41-4 HCAPLUS

CN Iron lithium manganese phosphate (Fe0.2-1LiMn0-0.8(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mn	0 - 0.8	7439-96-5
Li	1	7439-93-2
Fe	0.2 - 1	7439-89-6

RN 474317-42-5 HCAPLUS

CN Iron lithium manganese phosphate (Fe0.2-0.6LiMn0.4-0.8(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mn	0.4 - 0.8	7439-96-5
Li	1	7439-93-2
Fe	0.2 - 0.6	7439-89-6

IPCI H01M0004-40 [ICM,7]; H01M0004-50 [ICS,7]; H01M0004-52 [ICS,7];
A61K0009-14 [ICS,7]

IPCR H01M0004-40 [N,A]; H01M0004-58 [I,A]; H01M0010-0525 [N,A]; H01M0010-36 [N,A]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 49

IT Secondary batteries

(lithium; method of forming phosphate powder particle compns. with complex anions for electrodes and batteries)

IT Battery cathodes

Coating materials

IR lasers

(method of forming phosphate powder particle compns. with complex anions for electrodes and batteries)

IT 10045-86-0P, Ferric phosphate 14940-41-1P, Ferrous phosphate

15365-14-7P 474317-40-3P, Iron lithium phosphate
(FeLi0.1-1(PO4)) 474317-41-4P, Iron lithium manganese
phosphate (Fe0.2-1LiMn0-0.8(PO4)) 474317-42-5P, Iron
lithium manganese phosphate (Fe0.2-0.6LiMn0.4-0.8(PO4))

(method of forming phosphate powder particle compns. with complex anions for electrodes and batteries)

IT 7719-09-7, Thionyl chloride 7791-25-5, Sulfuryl

chloride 10025-87-3, Phosphorus oxychloride 10026-04-7,

Silicon tetrachloride 12627-13-3, Silicate 14265-44-2, Phosphate, processes 14808-79-8, Sulfate, processes 53116-81-7, Tetramethylammonium silicate

(precursor; method of forming phosphate powder particle compns. with complex anions for electrodes and batteries)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)
 REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L76 ANSWER 29 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2002:428819 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 137:8642

TITLE: Methods of making lithium metal compounds useful as cathode active materials in batteries

INVENTOR(S): Barker, Jeremy; Yazid, Saidi M.; Swoyer, Jeffrey L.

PATENT ASSIGNEE(S): Valence Technology, Inc., USA

SOURCE: PCT Int. Appl., 85 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002044084	A2	20020606	WO 2001-US43633	20011119
<--				
WO 2002044084	A3	20020815		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
US 6645452	B1	20031111	US 2000-724085	20001128
<--				
CA 2428201	A1	20020606	CA 2001-2428201	20011119
<--				
CA 2428201	C	20081028		
CA 2636694	A1	20020606	CA 2001-2636694	20011119
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CA 2638745	A1	20020606	CA 2001-2638745	20011119
<--				
CA 2638745	C	20110201		
CA 2638751	A1	20020606	CA 2001-2638751	20011119
<--				
AU 2002017799	A	20020611	AU 2002-17799	20011119
<--				
EP 1343720	A2	20030917	EP 2001-998506	20011119
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EP 1343720	B1	20080326		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				

10/577,279

JP 2004514639	T	20040520	JP 2002-546034	20011119
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JP 4248876	B2	20090402		
EP 1574477	A2	20050914	EP 2005-10853	20011119
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EP 1574477	A3	20051109		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				
CN 1703370	A	20051130	CN 2001-819694	20011119
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CN 100411977	C	20080820		
AT 390385	T	20080415	AT 2001-998506	20011119
			<--	
EP 2277829	A2	20110126	EP 2010-184419	20011119
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TW 544967	B	20030801	TW 2001-129206	20011126
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IN 2003CN00824	A	20050422	IN 2003-CN824	20030527
			<--	
IN 211794	A1	20071228		
KR 851484	B1	20080808	KR 2003-7007055	20030527
			<--	
US 20040126300	A1	20040701	US 2003-683643	20031009
			<--	
US 6960331	B2	20051101		
IN 2007CN02204	A	20070928	IN 2007-CN2204	20070522
			<--	
KR 2007112297	A	20071122	KR 2007-7025241	20071031
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KR 851485	B1	20080808		
KR 2007112298	A	20071122	KR 2007-7025243	20071031
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KR 851486	B1	20080808		
KR 2007112299	A	20071122	KR 2007-7025245	20071031
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KR 851487	B1	20080808		
JP 2009018989	A	20090129	JP 2008-224255	20080902
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PRIORITY APPLN. INFO.:

US 2000-724085	A1	20001128
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CA 2001-2428201	A3	20011119
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EP 2001-998506	A3	20011119
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EP 2005-10853	A3	20011119
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JP 2002-546034	A3	20011119
		<--
WO 2001-US43633	W	20011119
		<--
IN 2003-CN824	A3	20030527
		<--
KR 2003-7007055	A3	20030527
		<--

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STIN: 07 Jun 2002

AB The invention provides a novel method for making lithium mixed metal materials for battery cathodes. The lithium mixed metal materials comprise lithium and

at least one other metal besides lithium. The invention involves the reaction of a metal compound, a phosphate compound, with a reducing agent to reduce the metal and form a metal phosphate. The invention also includes methods of making lithium metal oxides involving reaction of a lithium compound and a metal oxide with a reducing agent.

IT 372075-07-1P, Iron lithium fluoride phosphate
 FeLiFPO4
 (methods of making lithium metal compds. useful as cathode
 active materials in batteries)
 RN 372075-87-1 HCAPLUS
 CN Iron lithium fluoride phosphate (FeLiF(PO4)) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
=====	=====	=====
F	1	14762-94-8
O4P	1	14265-44-2
Li	1	7439-93-2
Fe	1	7439-89-6

IPCI C01B0025-00 [ICM,7]
 IPCR C01B0025-00 [I,A]; C01B0025-45 [I,A]; C01B0025-455 [I,A]; H01M0004-02 [N,A]; H01M0004-50 [I,A]; H01M0004-505 [I,A]; H01M0004-52 [I,A]; H01M0004-525 [I,A]; H01M0004-58 [I,A]; H01M0010-052 [I,A]; H01M0010-36 [I,A]
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 49
 ST battery cathode lithium metal compd prepn
 IT Reduction
 (carbothermic; methods of making lithium metal compds. useful as cathode active materials in batteries)
 IT Secondary batteries
 (lithium; methods of making lithium metal compds. useful as cathode active materials in batteries)
 IT Battery cathodes
 Thermite process
 (methods of making lithium metal compds. useful as cathode active materials in batteries)
 IT 7664-38-2D, Phosphoric acid, transition metal compds. 7722-76-1, Ammonium dihydrogen phosphate 7757-87-1, Magnesium phosphate mg3(po4)2 7779-90-0, Zinc phosphate zn3(po4)2 7783-28-0, Diammonium hydrogen phosphate 7789-04-0, Chromium phosphate crpo4 7789-24-4, Lithium fluoride, processes 10045-86-0, Iron phosphate fepo4 13453-80-0, Lithium dihydrogen phosphate 14154-09-7, Manganese phosphate Mn3(PO4)2 14940-41-1, Iron phosphate fe3(po4)2 70172-55-3, Titanium phosphate tipo4
 (methods of making lithium metal compds. useful as cathode active materials in batteries)
 IT 7664-38-2DP, Phosphoric acid, lithiated transition metal compds. 12162-92-4P, Lithium vanadium oxide liv2o5 15365-14-7P, Iron lithium phosphate felipo4 84159-18-2P, Lithium vanadium phosphate Li3V2(PO4)3 372075-82-6P, Lithium manganese fluoride phosphate LiMnFPO4 372075-83-7P, Lithium vanadium fluoride phosphate (LiVF(PO4)) 372075-84-8P, Chromium lithium fluoride phosphate CrLiFPO4 372075-85-9P, Lithium titanium fluoride phosphate LiTiFPO4 372075-86-0P 372075-87-1P, Iron lithium fluoride phosphate FeLiFPO4 433708-98-6P, Copper lithium fluoride phosphate (CuLiF(PO4)) 433708-99-7P, Cobalt lithium fluoride

phosphate (CoLiF(PO₄)) 433709-00-3P, Lithium nickel fluoride
 phosphate (LiNiF(PO₄)) 433709-01-4P 632286-77-2P, Iron lithium
 magnesium phosphate (Fe_{0.9}LiMg_{0.1}(PO₄))
 (methods of making lithium metal compds. useful as cathode
 active materials in batteries)

IT 1333-74-0, Hydrogen, reactions
 (methods of making lithium metal compds. useful as cathode
 active materials in batteries)

IT 124-38-9, Carbon dioxide, uses 630-08-0, Carbon monoxide, uses
 7440-37-1, Argon, uses 7727-37-9, Nitrogen, uses
 (methods of making lithium metal compds. useful as cathode
 active materials in batteries)

IT 7440-44-0, Carbon, reactions
 (reducing agent; methods of making lithium metal compds. useful as
 cathode active materials in batteries)

OS.CITING REF COUNT: 15 THERE ARE 15 CAPLUS RECORDS THAT CITE THIS
 RECORD (17 CITINGS)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE
 RE FORMAT

L76 ANSWER 30 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
 ACCESSION NUMBER: 2002:291865 HCAPLUS Full-text
 DOCUMENT NUMBER: 136:312584
 TITLE: Method for preparation of cathode active
 material for nonaqueous lithium secondary battery

INVENTOR(S): Sato, Atsushi; Kuyama, Junji; Fukushima, Yuzuru;
 Hosoya, Mamoru

PATENT ASSIGNEE(S): Sony Corp., Japan

SOURCE: Eur. Pat. Appl., 15 pp.
 CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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EP 1198019	A2	20020417	EP 2001-123899	20011005
			<--	
EP 1198019	A3	20041222		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,				
PT, IE, SI, LT, LV, FI, RO				
JP 2002117847	A	20020419	JP 2000-308299	20001006
			<--	
CN 1348226	A	20020508	CN 2001-130348	20010930
			<--	
CN 1185730	C	20050119		
MX 2001009974	A	20030820	MX 2001-9974	20011003
			<--	
CA 2358344	A1	20020406	CA 2001-2358344	20011004
			<--	
US 20020106562	A1	20020808	US 2001-970573	20011004
			<--	
TW 523957	B	20030311	TW 2001-124684	20011005
			<--	
KR 837579	B1	20080613	KR 2001-61393	20011005
			<--	
PRIORITY APPLN. INFO.:			JP 2000-308299	A 20001006
			<--	

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STN: 19 Apr 2002

AB A nonaq. electrolyte cell includes a cathode containing a cathode active material, which is mainly composed of a compound represented by the general formula Li_xFePO_4 , where $0 < x \leq 1$, with the molar ratio of Li_3PO_4 to a compound represented by the general formula Li_xFePO_4 , which ratio is represented by $\text{Li}_3\text{PO}_4/\text{LiFePO}_4$, being $\text{Li}_3\text{PO}_4/\text{LiFePO}_4 \leq 6.67 + 10^{-2}$. Starting materials for the synthesis of compound Li_xFePO_4 where $0 < x \leq 1$ are Li_3PO_4 and $\text{Fe}_3(\text{PO}_4)_2$ or $\text{Fe}_3(\text{PO}_4)_2 \cdot n\text{H}_2\text{O}$ when n denotes a number of hydrates.

IT 198782-39-7P, Iron lithium phosphate ($\text{FeLiO}-1(\text{PO}_4)$)
(method for preparation of cathode active material for nonaq. lithium secondary battery)

RN 198782-39-7 HCAPLUS

CN Iron lithium phosphate ($\text{FeLiO}-1(\text{PO}_4)$) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
=====	=====	=====
O4P	1	14265-44-2
Li	0 - 1	7439-93-2
Fe	1	7439-89-6

IPCI H01M0004-58 [ICM,6]; H01M0010-40 [ICS,6]

IPCR H01M0010-40 [I,A]; C01B0025-45 [I,A]; H01M0004-02 [N,A]; H01M0004-48 [I,A]; H01M0004-58 [I,A]; H01M0010-36 [N,A]; H01M0010-44 [N,A]

CC 52-2 (#electrochemical, Radiational, and Thermal Energy Technology)

ST lithium nonaq secondary battery cathode prepn

IT Secondary batteries
(lithium; method for preparation of cathode active material for nonaq. lithium secondary battery)

IT Battery cathodes
Battery electrolytes
(method for preparation of cathode active material for nonaq. lithium secondary battery)

IT Fluoropolymers, uses
(method for preparation of cathode active material for nonaq. lithium secondary battery)

IT 10028-23-6, Phosphoric acid, iron(2+) salt (2:3)octahydrate
10377-52-3, Trilithium phosphate 14940-41-1, Iron phosphate
 $\text{Fe}_3(\text{PO}_4)_2$ 31096-55-6, Phosphoric acid, iron(2+) salt (2:3) hydrate
(method for preparation of cathode active material for nonaq. lithium secondary battery)

IT 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate
7782-42-5, Graphite, uses 21324-40-3, Lithium hexafluorophosphate
(method for preparation of cathode active material for nonaq. lithium secondary battery)

IT 198782-39-7P, Iron lithium phosphate ($\text{FeLiO}-1(\text{PO}_4)$)
(method for preparation of cathode active material for nonaq. lithium secondary battery)

IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
24937-79-9, PvdF
(method for preparation of cathode active material for nonaq. lithium secondary battery)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L76 ANSWER 31 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
 ACCESSION NUMBER: 2002:272913 HCAPLUS Full-text
 DOCUMENT NUMBER: 136:297399
 TITLE: Nonaqueous electrolyte secondary battery with a compound of an olivinic structure as a cathode active material
 INVENTOR(S): Okawa, Tsuyoshi; Hosoya, Mamoru; Kuyama, Junji; Fukushima, Yuzuru
 PATENT ASSIGNEE(S): Sony Corporation, Japan
 SOURCE: Eur. Pat. Appl., 15 pp.
 CODEN: EPXXDW
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1195836	A2	20020410	EP 2001-123892	20011005
<--				
EP 1195836	A3	20041124		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2002117833	A	20020419	JP 2000-308301	20001006
<--				
JP 3997702	B2	20071024		
CN 1349266	A	20020515	CN 2001-142412	20010930
<--				
CN 1180498	C	20041215		
CA 2358256	A1	20020406	CA 2001-2358256	20011003
<--				
US 20020106564	A1	20020808	US 2001-972395	20011005
<--				
US 6656635	B2	20031202		
TW 525312	B	20030321	TW 2001-124680	20011005
<--				
MX 2001010061	A	20030820	MX 2001-10061	20011005
<--				
KR 776523	B1	20071115	KR 2001-61592	20011006
<--				
PRIORITY APPLN. INFO.:			JP 2000-308301	A 20001006
<--				

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STN: 12 Apr 2002

AB A non-aqueous electrolyte secondary cell containing a compound of an olivinic structure as a cathode active material is to be improved in load characteristics and cell capacity. To this end, there is provided a non-aqueous electrolyte secondary cell including a cathode having a layer of a cathode active material containing a compound represented by the general formula $\text{Li}x\text{Fe}y\text{-yMyPO}_4$, where M is at least one selected from the group consisting of Mn, Cr, Co, Cu, Ni, V, Mo, Ti, Zn, Al, Ga, Mg, B and Nb, with $0.05 \leq x \leq 1.2$ and $0 \leq y \leq 0.8$, an anode having a layer of an anode active material and a non-aqueous electrolyte, wherein the layer of the cathode active material has a film thickness in a range from 25 to 110 μm . If a layer of a cathode active material is provided on each surface of a cathode current collector, the sum of the film thicknesses of the layers of the cathode active material ranges between 50 and 220 μm . The non-aqueous electrolyte may be a liquid-based electrolyte or a polymer electrolyte.

IT 407606-22-8, Chromium iron lithium phosphate
 (Cr0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-24-0, Cobalt iron
 lithium phosphate (Co0-0.8Fe0.2-1Li0.05-1.2(P04))
 407606-26-2, Copper iron lithium phosphate
 (Cu0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-28-4, Aluminum iron
 lithium phosphate (Al0-0.8Fe0.2-1Li0.05-1.2(P04))
 407606-30-8, Gallium iron lithium phosphate
 (Ga0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-32-0, Boron iron
 lithium phosphate (B0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-36-4
 , Iron lithium nickel phosphate (Fe0.2-1Li0.05-1.2Ni0-0.8(P04))
 407606-39-7, Iron lithium vanadium phosphate
 (Fe0.2-1Li0.05-1.2V0-0.8(P04)) 407606-42-2, Iron lithium
 molybdenum phosphate (Fe0.2-1Li0.05-1.2Mo0-0.8(P04))
 407606-44-4, Iron lithium titanium phosphate
 (Fe0.2-1Li0.05-1.2Ti0-0.8(P04)) 407606-47-7, Iron lithium
 zinc phosphate (Fe0.2-1Li0.05-1.2Zn0-0.8(P04)) 407606-49-9
 , Iron lithium magnesium phosphate (Fe0.2-1Li0.05-1.2Mg0-0.8(P04))
 407606-51-3, Iron lithium niobium phosphate
 (Fe0.2-1Li0.05-1.2Nb0-0.8(P04)) 407630-25-5, Aluminum iron
 lithium phosphate (Al0.7Fe0.3Li(P04)) 407630-29-9, Gallium
 iron lithium phosphate (Ga0.7Fe0.3Li(P04)) 407630-40-4,
 Boron iron lithium phosphate (B0.75Fe0.25Li(P04))
 (nonaq. electrolyte secondary battery with compound of olivinic
 structure as cathode active material)
 RN 407606-22-8 HCAPLUS
 CN Chromium iron lithium phosphate (Cr0-0.8Fe0.2-1Li0.05-1.2(P04)) (CA
 INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Cr	0 - 0.8	7440-47-3
Li	0.05 - 1.2	7439-93-2
Fe	0.2 - 1	7439-89-6

RN 407606-24-0 HCAPLUS
 CN Cobalt iron lithium phosphate (Co0-0.8Fe0.2-1Li0.05-1.2(P04)) (CA
 INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Co	0 - 0.8	7440-48-4
Li	0.05 - 1.2	7439-93-2
Fe	0.2 - 1	7439-89-6

RN 407606-26-2 HCAPLUS
 CN Copper iron lithium phosphate (Cu0-0.8Fe0.2-1Li0.05-1.2(P04)) (CA
 INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Cu	0 - 0.8	7440-50-8
Li	0.05 - 1.2	7439-93-2
Fe	0.2 - 1	7439-89-6

RN 407606-28-4 HCAPLUS
 CN Aluminum iron lithium phosphate (Al₀-0.8Fe_{0.2}-1Li_{0.05}-1.2(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	0.05 - 1.2	7439-93-2
Fe	0.2 - 1	7439-89-6
Al	0 - 0.8	7429-90-5

RN 407606-30-8 HCAPLUS
 CN Gallium iron lithium phosphate (Ga₀-0.8Fe_{0.2}-1Li_{0.05}-1.2(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Ga	0 - 0.8	7440-55-3
Li	0.05 - 1.2	7439-93-2
Fe	0.2 - 1	7439-89-6

RN 407606-32-0 HCAPLUS
 CN Boron iron lithium phosphate (B₀-0.8Fe_{0.2}-1Li_{0.05}-1.2(PO₄)) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
B	0 - 0.8	7440-42-8
Li	0.05 - 1.2	7439-93-2
Fe	0.2 - 1	7439-89-6

RN 407606-36-4 HCAPLUS
 CN Iron lithium nickel phosphate (Fe_{0.2}-1Li_{0.05}-1.2Ni_{0.8}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Ni	0 - 0.8	7440-02-0
Li	0.05 - 1.2	7439-93-2
Fe	0.2 - 1	7439-89-6

RN 407606-39-7 HCAPLUS
 CN Iron lithium vanadium phosphate (Fe_{0.2}-1Li_{0.05}-1.2V_{0.8}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
V	0 - 0.8	7440-62-2
Li	0.05 - 1.2	7439-93-2
Fe	0.2 - 1	7439-89-6

RN 407606-42-2 HCAPLUS

CN Iron lithium molybdenum phosphate (Fe0.2-1Li0.05-1.2Mo0-0.8(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mo	0 - 0.8	7439-98-7
Li	0.05 - 1.2	7439-93-2
Fe	0.2 - 1	7439-89-6

RN 407606-44-4 HCAPLUS

CN Iron lithium titanium phosphate (Fe0.2-1Li0.05-1.2Ti0-0.8(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Ti	0 - 0.8	7440-32-6
Li	0.05 - 1.2	7439-93-2
Fe	0.2 - 1	7439-89-6

RN 407606-47-7 HCAPLUS

CN Iron lithium zinc phosphate (Fe0.2-1Li0.05-1.2Zn0-0.8(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Zn	0 - 0.8	7440-66-6
Li	0.05 - 1.2	7439-93-2
Fe	0.2 - 1	7439-89-6

RN 407606-49-9 HCAPLUS

CN Iron lithium magnesium phosphate (Fe0.2-1Li0.05-1.2Mg0-0.8(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mg	0 - 0.8	7439-95-4
Li	0.05 - 1.2	7439-93-2
Fe	0.2 - 1	7439-89-6

RN 407606-51-3 HCAPLUS

CN Iron lithium niobium phosphate (Fe0.2-1Li0.05-1.2Nb0-0.8(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Nb	0 - 0.8	7440-03-1
Li	0.05 - 1.2	7439-93-2
Fe	0.2 - 1	7439-89-6

RN 407630-25-5 HCAPLUS

CN Aluminum iron lithium phosphate (Al_{0.7}Fe_{0.3}Li(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	1	7439-93-2
Fe	0.3	7439-89-6
Al	0.7	7429-90-5

RN 407630-29-9 HCAPLUS

CN Gallium iron lithium phosphate (Ga_{0.7}Fe_{0.3}Li(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Ga	0.7	7440-55-3
Li	1	7439-93-2
Fe	0.3	7439-89-6

RN 407630-40-4 HCAPLUS

CN Boron iron lithium phosphate (B_{0.75}Fe_{0.25}Li(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
B	0.75	7440-42-8
Li	1	7439-93-2
Fe	0.25	7439-89-6

IPCI H01M0010-40 [ICM,6]; H01M0004-58 [ICS,6]

IPCR H01M0010-052 [I,A]; H01M0004-02 [I,A]; H01M0004-136 [I,A]; H01M0004-58 [I,A]; H01M0006-10 [N,A]; H01M0010-36 [I,A]; H01M0010-38 [N,A]; H01M0010-40 [I,A]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Ball milling

Battery cathodes

Secondary batteries

(nonaq. electrolyte secondary battery with compound of olivine structure as cathode active material)

IT 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses 15365-14-7, Iron lithium phosphate felipo4 21324-40-3, Lithium hexafluorophosphate 407606-22-8, Chromium iron lithium phosphate (Cr_{0.0.8}Fe_{0.2-1}Li_{0.05-1.2}(PO₄)) 407606-24-0, Cobalt iron lithium phosphate (Co_{0.0.8}Fe_{0.2-1}Li_{0.05-1.2}(PO₄)) 407606-26-2, Copper iron lithium phosphate (Cu_{0.0.8}Fe_{0.2-1}Li_{0.05-1.2}(PO₄)) 407606-28-4, Aluminum iron lithium phosphate (Al_{0.0.8}Fe_{0.2-1}Li_{0.05-1.2}(PO₄)) 407606-30-8, Gallium iron lithium phosphate (Ga_{0.0.8}Fe_{0.2-1}Li_{0.05-1.2}(PO₄)) 407606-32-0, Boron iron lithium phosphate (B_{0.0.8}Fe_{0.2-1}Li_{0.05-1.2}(PO₄)) 407606-36-4, Iron lithium nickel phosphate (Fe_{0.2-1}Li_{0.05-1.2}Ni_{0.0-0.8}(PO₄)) 407606-39-7, Iron lithium vanadium phosphate (Fe_{0.2-1}Li_{0.05-1.2}V_{0.0-0.8}(PO₄)) 407606-42-2, Iron lithium molybdenum phosphate (Fe_{0.2-1}Li_{0.05-1.2}Mo_{0.0-0.8}(PO₄))

407606-44-4, Iron lithium titanium phosphate
 (Fe0.2-1Li0.05-1.2Ti0-0.8(PO4)) 407606-47-7, Iron lithium
 zinc phosphate (Fe0.2-1Li0.05-1.2Zn0-0.8(PO4)) 407606-49-9
 , Iron lithium magnesium phosphate (Fe0.2-1Li0.05-1.2Mg0-0.8(PO4))
 407606-51-3, Iron lithium niobium phosphate
 (Fe0.2-1Li0.05-1.2Nb0-0.8(PO4)) 407629-83-8 407629-87-2
 407629-90-7 407629-95-2 407630-01-7 407630-05-1 407630-10-8
 407630-14-2 407630-19-7 407630-25-5, Aluminum iron
 lithium phosphate (Al0.7Fe0.3Li(PO4)) 407630-29-9, Gallium
 iron lithium phosphate (Ga0.7Fe0.3Li(PO4)) 407630-35-7
 407630-40-4, Boron iron lithium phosphate (B0.75Fe0.25Li(PO4))
 407630-46-0
 (nonaq. electrolyte secondary battery with compound of olivine
 structure as cathode active material)
 IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
 (nonaq. electrolyte secondary battery with compound of olivine
 structure as cathode active material)
 OS.CITING REF COUNT: 7 THERE ARE 7 CAPLUS RECORDS THAT CITE THIS
 RECORD (8 CITINGS)
 REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE
 RE FORMAT

L76 ANSWER 32 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
 ACCESSION NUMBER: 2002:272909 HCAPLUS Full-text
 DOCUMENT NUMBER: 136:297395
 TITLE: Method for fabrication of cathode active
 material and a nonaqueous electrolyte battery
 INVENTOR(S): Hosoya, Mamoru; Fukushima, Yuzuru; Sakai, Hidecki;
 Kuyama, Junji
 PATENT ASSIGNEE(S): Sony Corporation, Japan
 SOURCE: Eur. Pat. Appl., 31 pp.
 CODEN: EPXXDW
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1195827	A2	20020410	EP 2001-123894	20011005
			<--	
EP 1195827	A3	20040310		
EP 1195827	B1	20100915		
			R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO	
JP 2002117848	A	20020419	JP 2000-308300	20001006
			<--	
JP 4491949	B2	20100630		
JP 2002117849	A	20020419	JP 2000-308313	20001006
			<--	
JP 4491950	B2	20100630		
US 20020124386	A1	20020912	US 2001-966918	20010928
			<--	
US 6814764	B2	20041109		
TW 513822	B	20021211	TW 2001-124109	20010928
			<--	
CN 1360353	A	20020724	CN 2001-138169	20010930
			<--	
CN 1243384	C	20060222		

CN 1722497	A	20060118	CN 2005-10087472	20010930
			<--	
CA 2358250	A1	20020406	CA 2001-2358250	20011003
			<--	
MX 2001009975	A	20030910	MX 2001-9975	20011003
			<--	
KR 949444	B1	20100329	KR 2001-61440	20011005
			<--	
PRIORITY APPLN. INFO.:			JP 2000-308300	A 20001006
			<--	
			JP 2000-308313	A 20001006
			<--	
			CN 2001-138169	A3 20010930
			<--	

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STN: 12 Apr 2002

AB The invention comprises a method for producing a cathode active material having superior cell characteristics through single-phase synthesis of a composite material composed of a compound represented by the general formula $\text{Li}_x\text{Fe}_y\text{MyPO}_4$ and a carbon material pos. and a method for producing a non-aqueous electrolyte cell employing the so produced cathode active material. To this end, the cathode active material is prepared by a step of mixing the starting materials for synthesis of the compound represented by the general formula $\text{Li}_x\text{Fe}_y\text{MyPO}_4$, a step of milling a mixture obtained by the mixing step, a step of compressing the mixture obtained by the mixing step to a preset d. and a step of sintering the mixture obtained by the compressing step. A carbon material is added in any one of the above steps prior to the sintering step. The d. of the mixture in the compressing step is set to not less than 1.71 g/cm³ and not larger than 2.45 g/cm³.

IT 198782-39-7, Iron lithium phosphate ($\text{FeLi}_{10}\text{-l(P04)}$)
(method for fabrication of cathode active material and
nonaq. electrolyte battery)

RN 198782-39-7 HCAPLUS

CN Iron lithium phosphate ($\text{FeLi}_{10}\text{-l(P04)}$) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
=====	=====	=====
O4P	1	14265-44-2
Li	0 - 1	7439-93-2
Fe	1	7439-89-6

IPCI H01M0004-58 [I,C]; H01M0004-58 [I,A]; H01M0010-00 [I,C]; H01M0010-0565 [I,A]

IPCR H01M0004-58 [I,C]; H01M0004-58 [I,A]; H01M0004-02 [I,C*]; H01M0004-02 [N,A]; H01M0004-136 [I,A]; H01M0010-00 [I,C]; H01M0010-052 [I,A]; H01M0010-0565 [I,A]; H01M0010-36 [I,C*]; H01M0010-36 [I,A]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST cathode active material nonaq electrolyte battery

IT Ball milling

Battery cathodes

Composites

Secondary batteries

(method for fabrication of cathode active material and
nonaq. electrolyte battery)

IT Carbon black, uses

(method for fabrication of cathode active material and
nonaq. electrolyte battery)

IT 7440-44-0, Carbon, uses 198782-39-7, Iron lithium

phosphate (FeLi0-1(P04)) 407606-22-8, Chromium iron lithium phosphate (Cr0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-24-0, Cobalt iron lithium phosphate (Co0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-26-2, Copper iron lithium phosphate (Cu0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-28-4, Aluminum iron lithium phosphate (Al0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-30-8, Gallium iron lithium phosphate (Ga0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-32-0, Boron iron lithium phosphate (B0-0.8Fe0.2-1Li0.05-1.2(P04)) 407606-34-2, Iron lithium manganese phosphate (Fe0.2-1Li0.05-1.2Mn0-0.8(P04)) 407606-36-4, Iron lithium nickel phosphate (Fe0.2-1Li0.05-1.2Ni0-0.8(P04)) 407606-39-7, Iron lithium vanadium phosphate (Fe0.2-1Li0.05-1.2V0-0.8(P04)) 407606-42-2, Iron lithium molybdenum phosphate (Fe0.2-1Li0.05-1.2Mo0-0.8(P04)) 407606-44-4, Iron lithium titanium phosphate (Fe0.2-1Li0.05-1.2Ti0-0.8(P04)) 407606-47-7, Iron lithium zinc phosphate (Fe0.2-1Li0.05-1.2Zn0-0.8(P04)) 407606-49-9, Iron lithium magnesium phosphate (Fe0.2-1Li0.05-1.2Mg0-0.8(P04)) 407606-51-3, Iron lithium niobium phosphate (Fe0.2-1Li0.05-1.2Nb0-0.8(P04)) 407629-87-2 407629-90-7 407629-95-2 407630-01-7 407630-10-8 407630-14-2 (method for fabrication of cathode active material and nonaq. electrolyte battery)

IT 15365-14-7P, Iron lithium phosphate FeLiP04 (method for fabrication of cathode active material and nonaq. electrolyte battery)

IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer (method for fabrication of cathode active material and nonaq. electrolyte battery)

OS.CITING REF COUNT: 10 THERE ARE 10 CAPLUS RECORDS THAT CITE THIS RECORD (10 CITINGS)

REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L76 ANSWER 33 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
 ACCESSION NUMBER: 2002:253129 HCAPLUS [Full-text](#)
 DOCUMENT NUMBER: 136:281939
 TITLE: Nonaqueous electrolyte battery cathode active material capable of reversibly doping/undoping lithium
 INVENTOR(S): Hosoya, Mamoru; Takahashi, Kimio; Fukushima, Yuzuru
 PATENT ASSIGNEE(S): Sony Corporation, Japan
 SOURCE: Eur. Pat. Appl., 16 pp.
 CODEN: EPXXDW
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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EP 1193787	A2	20020403	EP 2001-123181	20010927
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EP 1193787	A3	20040303		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2002110161	A	20020412	JP 2000-301399	20000929
			<--	
US 20020114754	A1	20020822	US 2001-961895	20010924
			<--	

TW 518781	B	20030121	TW 2001-123611	20010925
			<--	
MX 2001009736	A	20040812	MX 2001-9736	20010927
			<--	
KR 962053	B1	20100608	KR 2001-60569	20010928
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CN 1350341	A	20020522	CN 2001-142556	20010929
			<--	
CN 1187851	C	20050202		
PRIORITY APPLN. INFO.:			JP 2000-301399	A 20000929
			<--	

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STN: 05 Apr 2002

AB An LiFePO₄ carbon composite material is to be synthesized in a single phase to realize superior cell characteristics. To this end, in the preparation of a cathode active material, starting materials for synthesis of a compound having the formula Li_xFePO₄, where 0 < x ≤ 1, are mixed together, milled and sintered. A carbon material is added at one of these steps. As the starting materials for synthesis for LiFePO₄, Li₃PO₄, Fe₃PO₄, Fe₃(PO₄)₂ or its hydrate Fe₃(PO₄)₂·nH₂O, where n is the number of hydrates, are used, and the content of Fe₃+ in the total iron in Fe₃(PO₄)₂ or its hydrate Fe₃(PO₄)₂·nH₂O is set to 61 wt% or less.

IT 198782-39-7P, Iron lithium phosphate (FeLiO-1(PO₄))
(nonaq. electrolyte battery cathode active material
capable of reversibly doping/undoping lithium)

RN 198782-39-7 HCAPLUS

CN Iron lithium phosphate (FeLiO-1(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	0 - 1	7439-93-2
Fe	1	7439-89-6

IPCI H01M0004-58 [ICM,6]; H01M0010-40 [ICS,6]

IPCR C01B0025-37 [I,A]; C01B0031-02 [I,A]; H01M0004-02 [I,A]; H01M0004-36 [N,A]; H01M0004-48 [I,A]; H01M0004-58 [I,A]; H01M0004-62 [N,A]; H01M0010-36 [I,A]; H01M0010-40 [I,A]; H01M0010-44 [N,A]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST battery cathode lithium iron phosphate carbon composite

IT Secondary batteries

(lithium; nonaq. electrolyte battery cathode active
material capable of reversibly doping/undoping lithium)

IT Ball milling

Battery cathodes

Composites

Sintering

(nonaq. electrolyte battery cathode active material
capable of reversibly doping/undoping lithium)

IT Carbonaceous materials (technological products)

(nonaq. electrolyte battery cathode active material
capable of reversibly doping/undoping lithium)

IT Fluoropolymers, uses

(nonaq. electrolyte battery cathode active material
capable of reversibly doping/undoping lithium)

IT 10028-23-6, Phosphoric acid, iron(2+) salt (2:3) octahydrate

10045-86-0, Ferric phosphate 10377-52-3, Lithium phosphate li3po4
31096-55-6

(nonaq. electrolyte battery cathode active material capable of reversibly doping/undoping lithium)

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 7439-93-2, Lithium, uses 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer 15365-14-7, Iron lithium phosphate FeLiPO4 21324-40-3, Lithium hexafluorophosphate (nonaq. electrolyte battery cathode active material capable of reversibly doping/undoping lithium)

IT 24937-79-9, PvdF (nonaq. electrolyte battery cathode active material capable of reversibly doping/undoping lithium)

IT 198782-39-7P, Iron lithium phosphate (FeLiO-1(PO4)) (nonaq. electrolyte battery cathode active material capable of reversibly doping/undoping lithium)

IT 872-36-6, Vinylene carbonate (nonaq. electrolyte battery cathode active material capable of reversibly doping/undoping lithium)

OS.CITING REF COUNT: 6 THERE ARE 6 CAPLUS RECORDS THAT CITE THIS RECORD (9 CITINGS)

REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L76 ANSWER 34 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2002:253128 HCAPLUS Full-text

DOCUMENT NUMBER: 136:281938

TITLE: Nonaqueous electrolyte battery cathode active material capable of reversibly doping/undoping lithium

INVENTOR(S): Hosoya, Mamoru; Takahashi, Kimio; Fukushima, Yuzuru

PATENT ASSIGNEE(S): Sony Corporation, Japan

SOURCE: Eur. Pat. Appl., 15 pp. CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
EP 1193786	A2	20020403	EP 2001-123180	20010927
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EP 1193786	A3	20040303		
EP 1193786	B1	20070425		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2002110163	A	20020412	JP 2000-301401	20000929
			<--	
US 20020061274	A1	20020523	US 2001-965273	20010927
			<--	
US 6797431	B2	20040928		
TW 519776	B	20030201	TW 2001-123924	20010927
			<--	
MX 2001009738	A	20040812	MX 2001-9738	20010927
			<--	
KR 884216	B1	20090217	KR 2001-60496	20010928
			<--	
CN 1349265	A	20020515	CN 2001-142532	20010929

<--

CN 1180494 C 20041215 JP 2000-301401 A 20000929
 PRIORITY APPLN. INFO.: <--

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered SIN: 05 Apr 2002

AB A LiFePO₄ carbon composite material is to be synthesized in a single phase satisfactorily to achieve superior cell characteristics. In preparing a cathode active material, starting materials for synthesis of a compound represented by the general formula Li_xFePO₄, where 0 < x ≤ 1, are mixed, milled and a carbon material is added to the resulting mass at an optional time point in the course of mixing, milling and sintering. Li₃PO₄, Fe₃(PO₄)₂ or its hydrates Fe₃(PO₄)₂·nH₂O, where n denotes the number of hydrates, are used as the starting materials for synthesis of Li_xFePO₄. The temperature of a product from the sintering is set to 305° or less when the product from the sintering is exposed to atmospheric The oxygen concentration in a sintering atmospheric is set to 1012 ppm in volume or less at the time point of sintering.

IT 198782-39-7P, Iron lithium phosphate (FeLiO-1(PO₄))
 (nonaq. electrolyte battery cathode active material
 capable of reversibly doping/undoping lithium)

RN 198782-39-7 HCAPLUS

CN Iron lithium phosphate (FeLiO-1(PO₄)) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
O4P	1		14265-44-2
Li	0 - 1		7439-93-2
Fe	1		7439-89-6

IPCI H01M0004-58 [I,C]; H01M0004-58 [I,A]; H01M0010-36 [I,C]; H01M0010-40 [I,A]

IPCR C01G0049-00 [I,A]; C01B0031-02 [I,A]; H01M0004-02 [I,A]; H01M0004-36 [N,A]; H01M0004-48 [I,A]; H01M0004-58 [I,A]; H01M0004-62 [N,A]; H01M0010-36 [I,A]; H01M0010-40 [I,A]; H01M0010-42 [N,A]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST battery cathode lithium iron phosphate carbon composite

IT Secondary batteries
 (lithium; nonaq. electrolyte battery cathode active
 material capable of reversibly doping/undoping lithium)

IT Battery cathodes
 Composites
 Sintering
 (nonaq. electrolyte battery cathode active material
 capable of reversibly doping/undoping lithium)

IT Carbon black, uses
 Carbonaceous materials (technological products)
 (nonaq. electrolyte battery cathode active material
 capable of reversibly doping/undoping lithium)

IT Fluoropolymers, uses
 (nonaq. electrolyte battery cathode active material
 capable of reversibly doping/undoping lithium)

IT Ball milling
 (planetary; nonaq. electrolyte battery cathode active
 material capable of reversibly doping/undoping lithium)

IT 10028-23-6, Phosphoric acid, iron(2+) salt (2:3) octahydrate
 10377-52-3, Lithium phosphate 14940-41-1, Iron phosphate fe3(po₄)₂
 31096-55-6

(nonaq. electrolyte battery cathode active material capable of reversibly doping/undoping lithium)

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate 7439-93-2, Lithium, uses 7782-42-5, Graphite, uses 21324-40-3, Lithium hexafluorophosphate (nonaq. electrolyte battery cathode active material capable of reversibly doping/undoping lithium)

IT 872-36-6, Vinylene carbonate 7440-44-0, Carbon, uses 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer 24937-79-9, Poly(vinylidene fluoride) (nonaq. electrolyte battery cathode active material capable of reversibly doping/undoping lithium)

IT 15365-14-7P, Iron lithium phosphate FeLiO_4 198782-39-7P, Iron lithium phosphate (FeLiO_4) (nonaq. electrolyte battery cathode active material capable of reversibly doping/undoping lithium)

IT 7782-44-7, Oxygen, uses (nonaq. electrolyte battery cathode active material capable of reversibly doping/undoping lithium)

OS.CITING REF COUNT: 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS RECORD (3 CITINGS)

REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L76 ANSWER 35 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2002:253127 HCAPLUS Full-text

DOCUMENT NUMBER: 136:281937

TITLE: Nonaqueous electrolyte battery with cathode active material capable of reversibly doping/undoping lithium

INVENTOR(S): Hosoya, Mamoru; Takahashi, Kimio; Fukushima, Yuzuru

PATENT ASSIGNEE(S): Sony Corporation, Japan

SOURCE: Eur. Pat. Appl., 16 pp. CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1193785	A2	20020403	EP 2001-122769	20010921
EP 1193785	A3	20040303		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2002110164	A	20020412	JP 2000-301402	20000929
US 20020059719	A1	20020523	US 2001-956514	20010919
US 7101521	B2	20060905		
TW 513823	B	20021211	TW 2001-123221	20010920
MX 2001009681	A	20020412	MX 2001-9681	20010926
CN 1346159	A	20020424	CN 2001-138523	20010928
CN 1223028	C	20051012		

KR 835127

B1

20080605

KR 2001-60520

20010928

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PRIORITY APPLN. INFO.:

JP 2000-301402

A 20000929

<--

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered SIN: 05 Apr 2002

AB A LiFePO₄ carbon composite material is to be synthesized in a single phase satisfactorily to prevent the deterioration of the performance of the cathode active material from occurring and achieve superior cell characteristics. In preparing a cathode active material, starting materials for synthesis of a compound represented by the general formula Li_xFePO₄, where 0 < x ≤ 1, are mixed, milled and a carbon material is added to the resulting mass at an optional time point in the course of mixing, milling and sintering. Li₃PO₄, Fe₃(PO₄)₂ or its hydrates Fe₃(PO₄)₂·nH₂O, where n denotes the number of hydrates, are used as the starting materials for synthesis of Li_xFePO₄. The temperature of a product from the sintering is set to 305° or less when the product from the sintering is exposed to atmospheric

IT 198782-39-7P, Iron lithium phosphate (FeLiO-1(PO₄))

(nonaq. electrolyte battery with cathode active material capable of reversibly doping/undoping lithium)

RN 198782-39-7 HCAPLUS

CN Iron lithium phosphate (FeLiO-1(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====		
O4P	1	14265-44-2
Li	0 - 1	7439-93-2
Fe	1	7439-89-6

IPCI H01M0004-58 [ICM,6]; H01M0010-40 [ICS,6]

IPCR C01B0025-45 [I,A]; C01B0031-02 [I,A]; H01M0004-02 [N,A]; H01M0004-04 [I,A]; H01M0004-36 [N,A]; H01M0004-48 [I,A]; H01M0004-58 [I,A]; H01M0004-62 [N,A]; H01M0010-36 [I,A]; H01M0010-40 [I,A]; H01M0010-44 [N,A]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST battery cathode lithium iron phosphate carbon composite

IT Secondary batteries

(lithium; nonaq. electrolyte battery with cathode active material capable of reversibly doping/undoping lithium)

IT Battery cathodes

Composites

(nonaq. electrolyte battery with cathode active material capable of reversibly doping/undoping lithium)

IT Carbonaceous materials (technological products)

(nonaq. electrolyte battery with cathode active material capable of reversibly doping/undoping lithium)

IT Fluoropolymers, uses

(nonaq. electrolyte battery with cathode active material capable of reversibly doping/undoping lithium)

IT Ball milling

(planetary; nonaq. electrolyte battery with cathode active material capable of reversibly doping/undoping lithium)

IT 10377-52-3, Lithium phosphate li₃po₄ 14940-41-1, Iron phosphate fe₃(po₄)₂ 31096-55-6

(nonaq. electrolyte battery with cathode active material capable of reversibly doping/undoping lithium)

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate 872-36-6, Vinylene carbonate

7439-93-2, Lithium, uses 7782-42-5, Graphite, uses 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
 21324-40-3, Lithium hexafluorophosphate
 (nonaq. electrolyte battery with cathode active material capable of reversibly doping/undoping lithium)
 IT 7440-44-0, Carbon, uses 24937-79-9, PvdF
 (nonaq. electrolyte battery with cathode active material capable of reversibly doping/undoping lithium)
 IT 15365-14-7P, Iron lithium phosphate FeLiPO4 198782-39-7P, Iron lithium phosphate (FeLiO-1(PO4))
 (nonaq. electrolyte battery with cathode active material capable of reversibly doping/undoping lithium)
 OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)
 REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L76 ANSWER 36 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
 ACCESSION NUMBER: 2002:253126 HCAPLUS Full-text
 DOCUMENT NUMBER: 136:265826
 TITLE: Method for the preparation of cathode active material for a nonaqueous electrolyte battery
 INVENTOR(S): Hosoya, Mamoru; Takahashi, Kimio; Fukushima, Yuzuru
 PATENT ASSIGNEE(S): Sony Corporation, Japan
 SOURCE: Eur. Pat. Appl., 16 pp.
 CODEN: EPXXDW
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1193784	A2	20020403	EP 2001-122752	20010921
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EP 1193784	A3	20040310		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2002110165	A	20020412	JP 2000-301403	20000929
<--				
JP 4491946	B2	20100630		
TW 535316	B	20030601	TW 2001-123360	20010921
<--				
US 20020041998	A1	20020411	US 2001-961863	20010924
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US 6811924	B2	20041102		
MX 2001009737	A	20040812	MX 2001-9737	20010927
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KR 777932	B1	20071120	KR 2001-60645	20010928
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CN 1349264	A	20020515	CN 2001-142531	20010929
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CN 1177383	C	20041124		
PRIORITY APPLN. INFO.:			JP 2000-301403	A 20000929
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ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT				
ED Entered STN: 05 Apr 2002				

AB A LiFePO₄ carbon composite material is to be synthesized in a single phase satisfactorily to achieve superior cell characteristics. In preparing a cathode active material, a starting material for synthesis of a compound represented by the general formula Li_xFePO₄, where 0 < x ≤ 1, is mixed, milled and sintered and a carbon material is added to the resulting mass at an optional time point in the course of mixing, milling and sintering. Li₃PO₄, Fe₃(PO₄)₂ or its hydrates Fe₃(PO₄)₂·nH₂O, where n denotes the number of hydrates, are used as the starting material for synthesis of Li_xFePO₄. The particle size distribution of particles of the starting material for synthesis following the milling with the particle size not less than 3 μm is set to 2.2% or less in terms of the volumetric integration frequency.

IT 198782-39-7P, Iron lithium phosphate (FeLiO-1(PO₄))
(method for preparation of cathode active material for nonaq. electrolyte battery)

RN 198782-39-7 HCAPLUS

CN Iron lithium phosphate (FeLiO-1(PO₄)) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
O4P	1		14265-44-2
Li	0 - 1		7439-93-2
Fe	1		7439-89-6

IPCI H01M0004-58 [ICM,6]; H01M0010-40 [ICS,6]
 IPCR C01B0025-45 [I,A]; C01B0031-02 [I,A]; H01M0004-02 [I,A]; H01M0004-58 [I,A]; H01M0010-36 [I,A]; H01M0010-40 [I,A]
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST battery cathode lithium iron phosphate carbon composite
 IT Secondary batteries
 (lithium; method for preparation of cathode active material for nonaq. electrolyte battery)
 IT Battery cathodes
 Particle size distribution
 (method for preparation of cathode active material for nonaq. electrolyte battery)
 IT Carbon black, uses
 (method for preparation of cathode active material for nonaq. electrolyte battery)
 IT Ball milling
 (planetary; method for preparation of cathode active material for nonaq. electrolyte battery)
 IT 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer 21324-40-3, Lithium hexafluorophosphate
 (method for preparation of cathode active material for nonaq. electrolyte battery)
 IT 7440-44-0, Carbon, uses
 (method for preparation of cathode active material for nonaq. electrolyte battery)
 IT 15365-14-7P, Iron lithium phosphate FeLiPO₄ 198782-39-7P,
 Iron lithium phosphate (FeLiO-1(PO₄))
 (method for preparation of cathode active material for nonaq. electrolyte battery)
 OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)
 REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L76 ANSWER 37 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
 ACCESSION NUMBER: 2002:253125 HCAPLUS Full-text
 DOCUMENT NUMBER: 136:265825
 TITLE: Method for the preparation of cathode
 active material for a nonaqueous electrolyte
 battery
 INVENTOR(S): Hosoya, Mamoru; Takahashi, Kimio; Fukushima,
 Yuzuru
 PATENT ASSIGNEE(S): Sony Corporation, Japan
 SOURCE: Eur. Pat. Appl., 20 pp.
 CODEN: EPXXDW
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1193783	A2	20020403	EP 2001-122751	20010921
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EP 1193783	A3	20030514		
			R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO	
JP 2002110162	A	20020412	JP 2000-301400	20000929
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JP 3921931	B2	20070530		
TW 540181	B	20030701	TW 2001-123364	20010921
			<--	
EP 2256845	A1	20101201	EP 2010-10344	20010921
			<--	
			R: DE, FI, FR, GB, SE	
EP 2256846	A1	20101201	EP 2010-10345	20010921
			<--	
			R: DE, FI, FR, GB, SE	
US 20020102459	A1	20020801	US 2001-961862	20010924
			<--	
MX 2001009735	A	20040812	MX 2001-9735	20010927
			<--	
KR 968054	B1	20100708	KR 2001-60502	20010928
			<--	
CN 1346162	A	20020424	CN 2001-137901	20010929
			<--	
CN 1180497	C	20041215		
US 20070117013	A1	20070524	US 2006-565258	20061130
			<--	
KR 2008091067	A	20081009	KR 2008-91837	20080918
			<--	
KR 951328	B1	20100408		
PRIORITY APPLN. INFO.:			JP 2000-301400	A 20000929
			<--	
			EP 2001-122751	A3 20010921
			<--	
			US 2001-961862	A3 20010924
			<--	
			KR 2001-60502	A3 20010928
			<--	

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
 ED Entered STN: 05 Apr 2002

AB A nonaq. electrolyte cell is disclosed having superior electronic conductivity and superior cell characteristics. A cathode active material used for the cell is a composite material of a compound having the formula Li_xFePO_4 , where $0 < x \leq 1.0$, and a carbon material, wherein the sp. surface area as found by the Brunauer Emmet Teller formula is not less than 10.3 m²/g.

IT 198782-39-7P, Iron lithium phosphate ($\text{FeLiO}-1(\text{PO}_4)$)
(method for preparation of cathode active material for nonaq. electrolyte battery)

RN 198782-39-7 HCAPLUS

CN Iron lithium phosphate ($\text{FeLiO}-1(\text{PO}_4)$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O4P	1	14265-44-2
Li	0 - 1	7439-93-2
Fe	1	7439-89-6

IPCI H01M0004-58 [ICM,6]; H01M0010-40 [ICS,6]

IPCR H01M0004-48 [I,A]; C01B0031-02 [I,A]; H01M0004-02 [I,A]; H01M0004-36 [N,A]; H01M0004-58 [I,A]; H01M0004-62 [N,A]; H01M0010-36 [I,A]; H01M0010-40 [I,A]; H01M0010-44 [N,A]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST battery nonaq electrolyte cathode lithium iron phosphate

IT Secondary batteries
(lithium; method for preparation of cathode active material for nonaq. electrolyte battery)

IT Battery cathodes
Surface area
(method for preparation of cathode active material for nonaq. electrolyte battery)

IT Carbon black, uses
Carbonaceous materials (technological products)
(method for preparation of cathode active material for nonaq. electrolyte battery)

IT Fluoropolymers, uses
(method for preparation of cathode active material for nonaq. electrolyte battery)

IT 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate 7439-93-2, Lithium, uses 7440-44-0, Carbon, uses 21324-40-3, Lithium hexafluorophosphate
(method for preparation of cathode active material for nonaq. electrolyte battery)

IT 24937-79-9, PvdF
(method for preparation of cathode active material for nonaq. electrolyte battery)

IT 15365-14-7P, Iron lithium phosphate FeLiPO_4 198782-39-7P, Iron lithium phosphate ($\text{FeLiO}-1(\text{PO}_4)$)
(method for preparation of cathode active material for nonaq. electrolyte battery)

OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (3 CITINGS)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L76 ANSWER 38 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
 ACCESSION NUMBER: 2002:169249 HCAPLUS Full-text
 DOCUMENT NUMBER: 136:203096

TITLE: Method for preparation of cathode active material for nonaqueous electrolyte battery

INVENTOR(S): Hosoya, Mamoru; Takahashi, Kimio; Fukushima, Yuzuru

PATENT ASSIGNEE(S): Sony Corporation, Japan

SOURCE: Eur. Pat. Appl., 21 pp.
CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1184920	A2	20020306	EP 2001-120637	20010830
EP 1184920	A3	20040303	<--	
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2002075364	A	20020315	JP 2000-261277	20000830
			<--	
JP 4151210	B2	20080917		
TW 518785	B	20030121	TW 2001-121059	20010827
			<--	
MX 2001008733	A	20040812	MX 2001-8733	20010829
			<--	
KR 816272	B1	20080325	KR 2001-52393	20010829
			<--	
CN 1340869	A	20020320	CN 2001-135562	20010830
			<--	
CN 1199302	C	20050427		
PRIORITY APPLN. INFO.:			JP 2000-261277	A 20000830
			<--	

ED Entered STN: 08 Mar 2002

AB A cathode active material improved in electron conductivity and a non-aqueous electrolyte cell employing this cathode active material and which is improved in cell capacity and cyclic characteristics are disclosed. The cathode active material is composed of a compound having the general formula Li_xFePO_4 where $0 < x \leq 1.0$, and a carbon material, with the carbon content per unit weight being not less than 3 wt% and with the powder d. being not lower than 2.2 g/cm³.

IT 198782-39-7P, Iron lithium phosphate ($\text{FeLiO-1(PO}_4\text{)}$)
(method for preparation of cathode active material for nonaq. electrolyte battery)

RN 198782-39-7 HCAPLUS

CN Iron lithium phosphate ($\text{FeLiO-1(PO}_4\text{)}$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	0 - 1	7439-93-2
Fe	1	7439-89-6

IPCI H01M0004-58 [ICM,6]; H01M0004-62 [ICS,6]; H01M0004-04 [ICS,6]

IPCR H01M0010-40 [I,A]; C01B0031-02 [I,A]; H01M0004-02 [I,A]; H01M0004-36 [N,A]; H01M0004-58 [I,A]; H01M0004-62 [I,A]; H01M0010-36 [I,A]; H01M0010-38 [I,A]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST cathode active material prepn nonaq electrolyte battery
 IT Secondary batteries
 (lithium; method for preparation of cathode active material
 for nonaq. electrolyte battery)
 IT Battery cathodes
 Sintering
 (method for preparation of cathode active material for nonaq.
 electrolyte battery)
 IT Carbonaceous materials (technological products)
 Fluoropolymers, uses
 (method for preparation of cathode active material for nonaq.
 electrolyte battery)
 IT Carbon black, uses
 (method for preparation of cathode active material for nonaq.
 electrolyte battery)
 IT 10045-86-0, Phosphoric acid, iron(3+) salt (1:1) 10377-52-3, Lithium
 phosphate
 (method for preparation of cathode active material for nonaq.
 electrolyte battery)
 IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate
 616-38-6, Dimethyl carbonate 7439-93-2, Lithium, uses 21324-40-3,
 Lithium hexafluorophosphate
 (method for preparation of cathode active material for nonaq.
 electrolyte battery)
 IT 24937-79-9, PvdF
 (method for preparation of cathode active material for nonaq.
 electrolyte battery)
 IT 15365-14-7P, Iron lithium phosphate FeLiPO4 198782-39-7P,
 Iron lithium phosphate (FeLiO-1(PO4))
 (method for preparation of cathode active material for nonaq.
 electrolyte battery)
 IT 7440-44-0, Carbon, uses
 (method for preparation of cathode active material for nonaq.
 electrolyte battery)
 OS.CITING REF COUNT: 6 THERE ARE 6 CAPLUS RECORDS THAT CITE THIS
 RECORD (6 CITINGS)
 REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE
 RE FORMAT

L76 ANSWER 39 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
 ACCESSION NUMBER: 2001:192597 HCAPLUS Full-text
 DOCUMENT NUMBER: 134:210598
 TITLE: Preparation of lithium-containing phosphates for
 battery use
 INVENTOR(S): Barker, Jeremy; Saidi, M. Yazid
 PATENT ASSIGNEE(S): Valence Technology, Inc., USA
 SOURCE: U.S., 13 pp.
 CODEN: USXXAM
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 2
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
US 6203946	B1	20010320	US 1998-204944	19981203
			<--	
US 20010021472	A1	20010913	US 2001-776843	20010205
			<--	

US 6720110 B2 20040413
 US 20040086784 A1 20040506 US 2003-681563 20031006

PRIORITY APPLN. INFO.:

<--
 US 1996-717979 A1 19960923
 <--
 WO 1997-US15544 A1 19970904
 <--
 US 1998-204944 A1 19981203
 <--
 US 2001-776843 A1 20010205
 <--

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STN: 21 Mar 2001

AB The invention provides an electrochem. cell which comprises a first electrode and a second electrode which is a counter electrode to the first electrode. The first electrode comprises a phosphorous compound of the nominal general formula $\text{Li}_3\text{E}'\text{aE}''\text{b}(\text{PO}_4)_3$, desirably at least one E is a metal; and preferably, $\text{Li}_3\text{M}'\text{M}''(\text{PO}_4)_3$. E' and E'' are the same or different from one another. Where E' and E'' are the same, they are preferably metals having more than one oxidation state. Where E' and E'' are different from one another, they are preferably selected from the group of metals where at least one of E' and E'' has more than one oxidation state.

IT 329025-35-6P, Iron lithium phosphate ($\text{Fe}_2\text{Li}_{1-3}(\text{PO}_4)_3$)
 (preparation of lithium-containing phosphates for battery use)

RN 329025-35-6 HCAPLUS

CN Iron lithium phosphate ($\text{Fe}_2\text{Li}_{1-3}(\text{PO}_4)_3$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Li	1 - 3	7439-93-2
Fe	2	7439-89-6

INCL 429231100

IPCI H01M0004-58 [ICM,7]; H01M0004-48 [ICS,7]

IPCR H01M0004-02 [N,A]; H01M0004-04 [N,A]; H01M0004-58 [I,A]; H01M0010-0525 [I,A]; H01M0010-36 [I,A]

NCL 429/231.100; 429/218.100; 429/221.000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Secondary batteries

(lithium; preparation of lithium-containing phosphates for battery use)

IT Battery cathodes

(preparation of lithium-containing phosphates for battery use)

IT 36058-25-0P, Iron lithium phosphate $\text{Fe}_2\text{Li}_3(\text{PO}_4)_3$ 69104-85-4P,
 Chromium lithium phosphate $\text{Cr}_2\text{Li}_3(\text{PO}_4)_3$ 84159-18-2P, Lithium
 vanadium phosphate $\text{Li}_3\text{V}_2(\text{PO}_4)_3$ 285564-74-1P 329025-35-6P
 , Iron lithium phosphate ($\text{Fe}_2\text{Li}_{1-3}(\text{PO}_4)_3$) 329025-36-7P
 329025-38-9P 329025-39-0P

(preparation of lithium-containing phosphates for battery use)

OS.CITING REF COUNT: 13 THERE ARE 13 CAPLUS RECORDS THAT CITE THIS
 RECORD (13 CITINGS)

REFERENCE COUNT: 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE
 RE FORMAT

L76 ANSWER 40 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2000:774123 HCAPLUS Full-text

DOCUMENT NUMBER: 133:352634

TITLE: Electrode materials having increased surface conductivity
 INVENTOR(S): Ravet, Nathalie; Besner, Simon; Simoneau, Martin; Vallee, Alain; Armand, Michel; Magnan, Jean-francois
 PATENT ASSIGNEE(S): Hydro-Quebec, Can.
 SOURCE: Eur. Pat. Appl., 22 pp.
 CODEN: EPXXDW
 DOCUMENT TYPE: Patent
 LANGUAGE: French
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO. -----	KIND -----	DATE -----	APPLICATION NO. -----	DATE -----
EP 1049182	A2	20001102	EP 2000-401207 <--	20000502
EP 1049182	A3	20040211		
EP 1049182	B1	20080102		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
CA 2270771	A1	20001030	CA 1999-2270771 <--	19990430
CA 2307119	A1	20001030	CA 2000-2307119 <--	20000428
CA 2307119	C	20090728		
CA 2625896	A1	20001030	CA 2000-2625896 <--	20000428
CA 2658728	A1	20001030	CA 2000-2658728 <--	20000428
CA 2658741	A1	20001030	CA 2000-2658741 <--	20000428
CA 2658741	C	20100928		
CA 2658748	A1	20001030	CA 2000-2658748 <--	20000428
JP 2001015111	A	20010119	JP 2000-132779 <--	20000501
EP 1796189	A2	20070613	EP 2007-4289 <--	20000502
EP 1796189	A3	20070620		
EP 1796189	B1	20090325		
R: DE, FR, GB, IT				
US 20020195591	A1	20021226	US 2002-175794 <--	20020621
US 6855273	B2	20050215		
US 20040140458	A1	20040722	US 2003-740449 <--	20031222
US 6962666	B2	20051108		
US 20060060827	A1	20060323	US 2005-266339 <--	20051104
US 7344659	B2	20080318		
US 20080257721	A1	20081023	US 2008-33636 <--	20080219
US 7815819	B2	20101019		
JP 2008186807	A	20080814	JP 2008-41303 <--	20080222
US 20110086273	A1	20110414	US 2010-899067 <--	20101006
US 20110097479	A1	20110428	US 2010-951335 <--	20101122

PRIORITY APPLN. INFO.: CA 1999-2270771 A 19990430
 <--
 CA 2000-2307119 A3 20000428
 <--
 US 2000-560572 B1 20000428
 <--
 JP 2000-132779 A3 20000501
 <--
 EP 2000-401207 A3 20000502
 <--
 US 2002-175794 A3 20020621
 <--
 US 2003-740449 A1 20031222
 <--
 US 2005-266339 A3 20051104
 <--
 US 2008-33636 A1 20080219

ED Entered STN: 05 Nov 2000

AB Intercalated electrode materials comprising complex oxides, especially Li oxides, are prepared, suitable for redox reaction by exchange of alkali metal ions (especially Li) and electrons with an electrolyte. The complex oxide electrodes can be used in batteries, supercapacitors or electrochromic light moderators. The complex oxides have the general formula $AaMmZzOoNnFf$, where A is alkali metal (e.g., Li), M is ≥ 1 transition metal (e.g., Fe, Mn, V, Ti, Mo, Nb, Zn, W), Z is ≥ 1 nonmetal (e.g., P, S, Si, Se, As, Ge, B, Sn), and a,m,z,o,n,f are chosen for elec. neutrality. A conductive carbon coating is formed or deposited on the surface of the electrode material, e.g., by pyrolysis of an organic material, hydrocarbons or polymers, for increased surface conductivity

IT 304905-34-8P

(electrode materials having increased surface conductivity)

RN 304905-34-8 HCAPLUS

CN Iron lithium manganese phosphate silicate
 $(Fe_{0.8}Li_{1.2}Mn_{0.2}(PO_4)_{0.8}(SiO_4)_{0.2})$ (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4S1	0.2	17181-37-2
O4P	0.8	14265-44-2
Mn	0.2	7439-96-5
Li	1.2	7439-93-2
Fe	0.8	7439-89-6

IPCI H01M0004-48 [I,C]; H01M0004-48 [I,A]; H01M0004-04 [I,C]; H01M0004-04 [I,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]; H01M0004-62 [I,C]; H01M0004-62 [I,A]

IPCR H01M0006-16 [I,A]; C01B0031-02 [I,A]; H01G0009-00 [I,A]; H01G0009-155 [I,A]; H01M0004-136 [I,A]; H01M0004-24 [I,A]; H01M0004-36 [N,A]; H01M0004-48 [I,A]; H01M0004-485 [I,A]; H01M0004-58 [I,A]; H01M0004-62 [I,A]; H01M0006-18 [I,A]; H01M0010-052 [N,A]; H01M0010-36 [N,A]

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 57, 72, 76

IT Battery cathodes
 Capacitor electrodes
 Electrochromic materials
 Electrodes
 Primary batteries

Secondary batteries
Thermal decomposition
(electrode materials having increased surface conductivity)

IT Primary batteries
Secondary batteries
(lithium; electrode materials having increased surface conductivity)

IT Fluorides, uses
(oxyfluorides; electrode materials having increased surface conductivity)

IT 7440-44-0P, Carbon, uses 15365-14-7P, Iron lithium phosphate
(FeLiPO4) 30734-08-8P, Lithium manganese silicate Li2MnSiO4
39302-37-9P, Lithium titanium oxide 180984-63-8P, Lithium magnesium
titanium oxide 252943-50-3P, Lithium vanadium phosphate silicate
Li3.5V2(PO4)2.5(SiO4)0.5 304905-30-4P 304905-31-5P, Iron lithium
fluoride (FeLiO.2F3) 304905-32-6P, Lithium manganese nitride
oxide (Li3MnNO) 304905-33-7P 304905-34-8P
304905-35-9P, Lithium magnesium titanium oxide (Li3.5Mg0.5Ti4O12)
304905-36-0P, Iron lithium phosphorus silicon oxide 304905-37-1P
304905-38-2P, Iron lithium phosphorus fluoride oxide
304905-39-3P 304905-40-6P 304905-41-7P 304905-42-8P
(electrode materials having increased surface conductivity)

IT 78-10-4 109-72-8, Butyl lithium, uses 546-68-9 553-91-3, Lithium
oxalate 554-13-2, Lithium carbonate 1310-65-2, Lithium hydroxide
1344-43-0, Manganese oxide MnO, uses 5931-89-5, Cobalt acetate
5965-38-8, Cobalt oxalate dihydrate 6108-17-4, Lithium acetate
dihydrate 6156-78-1, Manganese acetate tetrahydrate 6566-16-7,
Manganese oxalate dihydrate 7722-76-1, Ammonium dihydrogen phosphate
7783-50-8, Iron fluoride FeF3 7803-55-6, Ammonium vanadate
9003-01-4, Polyacrylic acid 9011-17-0,
Hexafluoropropylene-vinylidene fluoride copolymer
10028-22-5, Ferric sulfate 10102-24-6, Lithium silicate Li2SiO3
10377-52-3, Lithium phosphate Li3PO4 13463-10-0, Ferric phosphate
dihydrate 14567-67-0, Vivianite 16674-78-5, Magnesium acetate
tetrahydrate 25656-42-2, Lithium polyacrylate 26134-62-3, Lithium
nitride 145673-07-0
(electrode materials having increased surface conductivity)

IT 57-50-1, reactions 77-47-4, Hexachlorocyclopentadiene 98-00-0D,
Furfuryl alcohol, derivs., polymers 100-42-5D, Styrene, derivs.,
polymers 107-13-1D, Acrylonitrile, derivs., polymers 108-05-4D,
Vinyl acetate, derivs., polymers 108-95-2D, Phenol, derivs.,
polymers, reactions 115-07-1, 1-Propene, reactions 120-12-7,
Anthracene, reactions 128-69-8D, 3,4,9,10-Perylenetetracarboxylic
acid dianhydride, polymers with Jeffamine 600 198-55-0D, Perylene,
derivs., polymers 630-08-0, Carbon monoxide, reactions 996-70-3,
Tetrakis(dimethylamino)ethylene 1321-74-0D, Divinylbenzene, derivs.,
polymers 6674-22-2, DBU 9002-88-4 9002-89-5 9003-07-0,
Polypropylene 9003-17-2D, Polybutadiene, derivs. 9004-34-6D,
Cellulose, derivs., reactions 9004-35-7, Cellulose acetate
9005-25-8D, Starch, derivs., reactions 15133-82-1,
Tetrakis(triphenylphosphine)nickel 25014-41-9, Polyacrylonitrile
51736-72-2, Polyvinylidene bromide 157889-12-8, Jeffamine
ED 600-perylenetetracarboxylic acid dianhydride copolymer
(electrode materials having increased surface conductivity)

OS.CITING REF COUNT: 100 THERE ARE 100 CAPLUS RECORDS THAT CITE THIS
RECORD (122 CITINGS)

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN THE
RE FORMAT

L76 ANSWER 41 OF 41 HCAPLUS COPYRIGHT 2011 ACS on STN
ACCESSION NUMBER: 1998:221666 HCAPLUS Full-text

DOCUMENT NUMBER: 129:20826
 ORIGINAL REFERENCE NO.: 129:4335a,4338a
 TITLE: New cathode materials for rechargeable lithium batteries: the 3-D framework structures $\text{Li}_3\text{Fe}_2(\text{XO}_4)_3$ ($\text{X} = \text{P}, \text{As}$)
 AUTHOR(S): Masquelier, C.; Padhi, A. K.; Nanjundaswamy, K. S.; Goodenough, J. B.
 CORPORATE SOURCE: Center for Materials Science and Engineering, University of Texas at Austin, Austin, TX, 78712-1063, USA
 SOURCE: Journal of Solid State Chemistry (1998), 135(2), 228-234
 CODEN: JSSCBI; ISSN: 0022-4596
 PUBLISHER: Academic Press
 DOCUMENT TYPE: Journal
 LANGUAGE: English

ED Entered STN: 22 Apr 1998

AB Electrochem. insertion of lithium into four $\text{Li}_3\text{Fe}_2(\text{XO}_4)_3$ polymorphs ($\text{X} = \text{P}$ or As) with 3-D framework structures was carried out in " Li/LiClO_4 (PC:DME)/cathode" coin cells. Approx. 2 Li per formula unit could be reversibly inserted into the three different structures, which corresponds to the reduction of all Fe^{3+} to Fe^{2+} between 2.5 and 3.5 V vs lithium. The position of the $\text{Fe}^{3+}/\text{Fe}^{2+}$ redox couple below the lithium-anode Fermi energy is nearly independent of the structure and of whether $\text{X} = \text{P}$ or As . There is, however, a clear dependence of (i) the shape of the V_{cc} vs x curves for $\text{Li}_3\text{xFe}_2(\text{XO}_4)_3$ and (ii) the charge-discharge rate capabilities on the crystal structure of the cathode material.

IT 198782-41-1, Iron lithium phosphate ($\text{Fe}_2\text{Li}_3\text{-5}(\text{PO}_4)_3$)
 (new cathode materials for rechargeable lithium
 batteries: 3-D framework structures $\text{Li}_3\text{Fe}_2(\text{XO}_4)_3$ ($\text{X} = \text{P}, \text{As}$))

RN 198782-41-1 HCAPLUS

CN Iron lithium phosphate ($\text{Fe}_2\text{Li}_3\text{-5}(\text{PO}_4)_3$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Li	3 - 5	7439-93-2
Fe	2	7439-89-6

CC 72-2 (Electrochemistry)

Section cross-reference(s): 52, 56

ST rechargeable lithium battery cathode electrochem insertion;
 ionic conductor iron phosphate arsenate structure

IT Electric charge
 (electrochem. charge-discharge curves for the first cycle of
 lithium iron phosphate/arsenate cathodes)

IT Current density
 (in comparison of capacities for polymorphs $\text{Li}_3\text{Fe}_2(\text{PO}_4)_3$
 cathode materials for rechargeable lithium
 batteries)

IT Carbon black, uses
 (in formation of $\text{Li}_3\text{Fe}_2(\text{XO}_4)_3$ ($\text{X} = \text{P}, \text{As}$) cathode for
 rechargeable lithium batteries)

IT Fluoropolymers, uses
 (in formation of $\text{Li}_3\text{Fe}_2(\text{XO}_4)_3$ ($\text{X} = \text{P}, \text{As}$) cathode for
 rechargeable lithium batteries)

IT Battery cathodes
 Secondary batteries
 (new cathode materials for rechargeable lithium)

batteries: 3-D framework structures $\text{Li}_3\text{Fe}_2(\text{XO}_4)_3$ ($\text{X} = \text{P}, \text{As}$)

IT Oxidation, electrochemical
(of Fe^{2+} in lithium iron phosphate and arsenate cathodes)

IT Reduction, electrochemical
(of Fe^{3+} in lithium iron phosphate and arsenate cathodes)

IT 16986-74-6
(as cathode materials for rechargeable lithium batteries)

IT 16570-18-6
(cathode materials for rechargeable lithium batteries)

IT 207733-44-6, Iron lithium phosphate ($\text{Fe}_2\text{Li}_5(\text{PO}_4)_3$)
(electrochem. formation: new cathode materials for rechargeable lithium batteries)

IT 207733-39-9, Iron lithium phosphate ($\text{Fe}_2\text{Li}_4(\text{PO}_4)_3$)
(electrochem. formation: new cathode materials for rechargeable lithium batteries)

IT 9002-84-0, PTFE
(in formation of $\text{Li}_3\text{Fe}_2(\text{XO}_4)_3$ ($\text{X} = \text{P}, \text{As}$) cathode for rechargeable lithium batteries)

IT 36058-25-0P 101324-14-5P
(monoclinic and rhombohedral; as new cathode materials for rechargeable lithium batteries; lithium electrochem., intercalation/deintercalation by)

IT 198782-41-1, Iron lithium phosphate ($\text{Fe}_2\text{Li}_3-5(\text{PO}_4)_3$)
(new cathode materials for rechargeable lithium batteries: 3-D framework structures $\text{Li}_3\text{Fe}_2(\text{XO}_4)_3$ ($\text{X} = \text{P}, \text{As}$))

IT 207733-37-7, Iron lithium arsenate ($\text{Fe}_2\text{Li}_3-4.8(\text{AsO}_4)_3$)
(new cathode materials for rechargeable lithium batteries: electrochem. formation of)

OS.CITING REF COUNT: 145 THERE ARE 145 CAPLUS RECORDS THAT CITE THIS RECORD (146 CITINGS)

REFERENCE COUNT: 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d his nofile

(FILE 'HOME' ENTERED AT 11:15:17 ON 01 JUN 2011)

FILE 'HCAPLUS' ENTERED AT 11:15:31 ON 01 JUN 2011

L1 1 SEA SPE=ON ABB=ON PLU=ON US20080131777/PN
SEL RN

FILE 'REGISTRY' ENTERED AT 11:15:44 ON 01 JUN 2011

L2 29 SEA SPE=ON ABB=ON PLU=ON (10025-73-7/BI OR 10241-05-1/BI
OR 22519-64-8/BI OR 7447-39-4/BI OR 7550-45-0/BI OR
7646-78-8/BI OR 7646-85-7/BI OR 7718-98-1/BI OR 7772-99-8/B
I OR 851190-38-0/BI OR 851190-39-1/BI OR 851190-40-4/BI OR
851190-41-5/BI OR 851190-42-6/BI OR 851190-43-7/BI OR
851190-44-8/BI OR 851190-45-9/BI OR 851190-46-0/BI OR
851190-47-1/BI OR 851190-48-2/BI OR 851190-49-3/BI OR
851190-50-6/BI OR 851190-51-7/BI OR 851190-53-9/BI OR
851190-54-0/BI OR 851190-55-1/BI OR 851190-56-2/BI OR
851190-57-3/BI OR 851190-58-4/BI)
L3 20 SEA SPE=ON ABB=ON PLU=ON L2 AND PO4
L4 20 SEA SPE=ON ABB=ON PLU=ON L2 AND O4P
L5 20 SEA SPE=ON ABB=ON PLU=ON L2 AND FE/ELS
L6 1828 SEA SPE=ON ABB=ON PLU=ON (LI(L)FE(L)P(L)O)/ELS
L7 1338 SEA SPE=ON ABB=ON PLU=ON L6 AND O4P
L8 121 SEA SPE=ON ABB=ON PLU=ON L7 AND 4/ELC.SUB
L9 0 SEA SPE=ON ABB=ON PLU=ON L8 AND L2
L10 330 SEA SPE=ON ABB=ON PLU=ON L7 AND (V OR CR OR CU OR ZN OR
IN OR SN OR MO OR TI)/ELS
L11 20 SEA SPE=ON ABB=ON PLU=ON L10 AND L2
L12 9 SEA SPE=ON ABB=ON PLU=ON L2 NOT L11

FILE 'HCAPLUS' ENTERED AT 11:27:21 ON 01 JUN 2011

L13 189 SEA SPE=ON ABB=ON PLU=ON L10
L14 99730 SEA SPE=ON ABB=ON PLU=ON L12
L15 8 SEA SPE=ON ABB=ON PLU=ON L13 AND L14
L16 761 SEA SPE=ON ABB=ON PLU=ON L7
L17 12 SEA SPE=ON ABB=ON PLU=ON L14 AND L16
L18 12 SEA SPE=ON ABB=ON PLU=ON L15 OR L17
L19 1 SEA SPE=ON ABB=ON PLU=ON L13 AND L1
L20 595 SEA SPE=ON ABB=ON PLU=ON L16 AND ELECTROCHEM?/SC, SX
L21 149 SEA SPE=ON ABB=ON PLU=ON L20 AND (HALIDE? OR CHLORIDE?
OR FLUORIDE? OR BROMIDE? OR IODIDE?)
E SECONDARY BATTERIES/CT
L22 95725 SEA SPE=ON ABB=ON PLU=ON "SECONDARY BATTERIES"+PFT/CT
L23 121 SEA SPE=ON ABB=ON PLU=ON L21 AND L22
L24 49 SEA SPE=ON ABB=ON PLU=ON L23 AND PROC/RL
L25 15 SEA SPE=ON ABB=ON PLU=ON L13 AND L24
L26 1 SEA SPE=ON ABB=ON PLU=ON L25 AND L1
L27 QUE SPE=ON ABB=ON PLU=ON CATHODE# OR POSITIVE ELECTRODE#
L28 42 SEA SPE=ON ABB=ON PLU=ON L24 AND L27
L29 33 SEA SPE=ON ABB=ON PLU=ON L28 AND PREP/RL
L30 39 SEA SPE=ON ABB=ON PLU=ON L25 OR L29
L31 34 SEA SPE=ON ABB=ON PLU=ON L30 NOT L18

FILE 'REGISTRY' ENTERED AT 11:38:42 ON 01 JUN 2011

E FE.LI.O4P/MF
L32 113 SEA SPE=ON ABB=ON PLU=ON FE.LI.O4P/MF
L33 0 SEA SPE=ON ABB=ON PLU=ON L32 NOT TIS/CI

L34 113 SEA SPE=ON ABB=ON PLU=ON L32 AND 1/LI
 L35 113 SEA SPE=ON ABB=ON PLU=ON L34 AND 1/FE
 L36 0 SEA SPE=ON ABB=ON PLU=ON L35 AND LITHIUM IRON PHOSPHATE/
 CN
 E IRON LITHIUM PHOSPHATE/CN
 L37 1 SEA SPE=ON ABB=ON PLU=ON "IRON LITHIUM PHOSPHATE"/CN

 FILE 'HCAPLUS' ENTERED AT 12:15:58 ON 01 JUN 2011
 L38 497 SEA SPE=ON ABB=ON PLU=ON L37
 L39 368 SEA SPE=ON ABB=ON PLU=ON L38 AND L27
 L40 297 SEA SPE=ON ABB=ON PLU=ON L39 AND L22
 L41 100 SEA SPE=ON ABB=ON PLU=ON L40 AND PROC/RL
 L42 3 SEA SPE=ON ABB=ON PLU=ON L41 AND L13
 L43 12 SEA SPE=ON ABB=ON PLU=ON L38 AND L13
 L44 38 SEA SPE=ON ABB=ON PLU=ON L38 AND L16
 L45 38 SEA SPE=ON ABB=ON PLU=ON L43 OR L42 OR L44
 L46 34 SEA SPE=ON ABB=ON PLU=ON L45 AND ELECTROCHEM?/SC, SX
 L47 13 SEA SPE=ON ABB=ON PLU=ON L46 AND (1940-2006)/PRY, AY, PY
 L48 16 SEA SPE=ON ABB=ON PLU=ON L31 AND (1940-2006)/PRY, AY, PY
 L49 3 SEA SPE=ON ABB=ON PLU=ON L18 AND (1940-2006)/PRY, AY, PY
 L50 29 SEA SPE=ON ABB=ON PLU=ON L47 OR L48
 L51 29 SEA SPE=ON ABB=ON PLU=ON L50 NOT L49
 L52 125 SEA SPE=ON ABB=ON PLU=ON L8
 L53 111 SEA SPE=ON ABB=ON PLU=ON L52 AND ELECTROCHEM?/SC, SX
 L54 80 SEA SPE=ON ABB=ON PLU=ON L53 AND L22
 L55 65 SEA SPE=ON ABB=ON PLU=ON L54 AND L27
 L57 37 SEA SPE=ON ABB=ON PLU=ON L55 AND (1840-2006)/PRY, AY, PY
 L58 3 SEA SPE=ON ABB=ON PLU=ON L18 AND (1840-2006)/PRY, AY, PY
 L59 13 SEA SPE=ON ABB=ON PLU=ON L46 AND (1840-2006)/PRY, AY, PY
 L60 16 SEA SPE=ON ABB=ON PLU=ON L31 AND (1840-2006)/PRY, AY, PY
 L61 29 SEA SPE=ON ABB=ON PLU=ON L59 OR L60
 L62 29 SEA SPE=ON ABB=ON PLU=ON L61 NOT L58
 L63 37 SEA SPE=ON ABB=ON PLU=ON L57 NOT L58
 L64 57 SEA SPE=ON ABB=ON PLU=ON L62 OR L63
 L65 60 SEA SPE=ON ABB=ON PLU=ON L58 OR L64
 L66 32 SEA SPE=ON ABB=ON PLU=ON L65 AND PROC/RL
 L67 44 SEA SPE=ON ABB=ON PLU=ON L65 AND PREP/RL
 L68 49 SEA SPE=ON ABB=ON PLU=ON L66 OR L67
 L69 26 SEA SPE=ON ABB=ON PLU=ON L68 AND DEV/RL
 L70 1 SEA SPE=ON ABB=ON PLU=ON L69 AND L1
 L71 11 SEA SPE=ON ABB=ON PLU=ON L68 AND CATHODE MATERIAL?
 E BATTERY CATHODES/CT
 L72 31511 SEA SPE=ON ABB=ON PLU=ON "BATTERY CATHODES"+PFT/CT
 L73 37 SEA SPE=ON ABB=ON PLU=ON L68 AND L72
 L74 41 SEA SPE=ON ABB=ON PLU=ON L69 OR L71 OR L73
 L75 20 SEA SPE=ON ABB=ON PLU=ON L74 AND (HALIDE? OR CHLORIDE?
 OR FLUORIDE? OR BROMIDE? OR IODIDE?)
 L76 41 SEA SPE=ON ABB=ON PLU=ON L74 OR L75